DOCTOR OF PHILOSOPHY

# Determinants of accounting choices in Egypt an empirical study

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*an empirical study*

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# Determinants of Accounting Choices in Egypt: An Empirical Study

By

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## Dedication

To my parents, my husband and my children

(Fadwa, Maii and Ahmed)

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# Acknowledgements

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## Declaration

I hereby declare that I am the author of this thesis; that the work of which this thesis is a record has been done by myself, and that it has not previously been accepted for a higher degree.

Signed: ..Hanaa. E.L-. Habashy Date: 12-.4-.2004

Hanaa A. El-Habashy

## Certificate

We certify that Hanaa A. El-Habashy has worked the equivalent of nine terms on this research, and that the conditions of the relevant ordinance and regulations have been fulfilled.

Signed: ..... Date: ..18-..5-..2004

Prof. John. R. Grinyer

Signed: ..... Date: 18/5/04

Dr. Colin. R. Dey

# Abstract

The positive accounting theory (PAT) approach hypothesises that, in imperfect markets, accounting choice may be determined by managers seeking to influence reported earnings and capital structure (Watts and Zimmerman, 1978). In particular, PAT argues that accounting choices are likely to be motivated by factors such as managers' bonus schemes, the firm's debt/equity ratios and the wider political influence of third parties (Watts and Zimmerman, 1978; 1986). Most prior literature focuses on Western countries, primarily the USA. However, this literature is limited by the manner in which ownership is measured as well as in the theorising of the link between ownership structure and PAT hypotheses. PAT predications have not yet been extensively examined in developing countries. The Egyptian empirical context of this thesis provides a valuable opportunity to examine accounting choices in a relatively recently established, and rapidly growing, capital market. Specifically, the thesis suggests that such choices are likely to be different in manager–controlled firms from those in owner–controlled firms because agency issues vary between the two categories of companies. In particular, the consequences of managers' relationships with their owners are considered for the two types of firms. These consequences are then examined within the extant literature of the PAT hypotheses.

This study develops PAT's basic hypotheses in the Egyptian context and tests them using both (a) data from the Cairo stock exchange on publicly traded companies and (b) questionnaire–based data that includes many smaller privately owned companies. The sample for the questionnaire survey consists of the 320 largest firms operating in the Cairo area, Alexandria and Menoufia. The sample of the database

consists of the 118 most frequently traded firms listed on the Cairo stock exchange: the data was collected from the annual reports published during the period 1999–2001. Two accounting alternatives were chosen as dependent variables in the current study: the depreciation policy and the inventory valuation decisions of the firms responding to the questionnaire survey and included in the database. The economic factors considered in the current study that might influence a firm's choice of accounting methods are the firm's ownership/control status, the existence of bonus schemes, a firm's leverage characteristics and a firm's size. The data obtained using these methods are then statistically analysed in order to determine if significant conclusions can be achieved by using both univariate and multivariate analysis.

The findings from the study as a whole (including both univariate and multivariate analyses) are broadly consistent with the main bonus plans contracting and debt–covenant hypotheses. These findings suggest that the existence of management incentive plans are significantly related to depreciation policies and inventory valuation methods that increase accounting income. Moreover, there is some evidence that the leverage characteristics of firms are related to the choices of depreciation policies and inventory valuation methods. However, the nature and influence of political visibility on managers' accounting choices is unclear. Even the largest companies tend to adopt income–increasing accounting methods. Such behaviour is consistent with managers believing that there are no significant political costs associated with increasing levels of income for large entities. It is possible that accounting choices in Egypt reflect the historical, cultural, fiscal and regulatory influences that exist in that country. Overall, the study provides evidence to support the relevance of the identified explicit contracting PAT hypotheses to accounting in Egypt, but it lends no empirical support for the relevance of the implicit political costs contracting theory hypothesis in Egypt.

The general conclusion that can be derived from the analysis undertaken within the present study is that PAT hypotheses may offer some explanations about accounting choices in developing countries – particularly Egypt. Even though the PAT approach is in effect based on North American contract analysis and on a US style institutional environment, it appears to offer useful insights into how Egyptian managers choose between discretionary accounting alternatives in dissimilar ownership/control status. It remains likely that PAT hypotheses that are well supported in the USA may not be appropriate in many other countries so that additional (and in some cases, different) variables may be needed to explain accounting policy choices in some economies.

# Chapter 1: Introduction and Outline of the Study

## 1.1 Introduction

The positive accounting theory[1] (PAT) approach developed by Watts and Zimmerman (1978; 1986; 1990) argues that accounting choices are partly influenced by managerial opportunism. In particular, PAT researchers hypothesise that (a) to avoid violating debt covenants and (b) to increase their own remuneration (when it is associated with company earnings) managers will often prefer income–increasing accounting methods. In contrast, it has been hypothesised that if there appears to be a likelihood of politically imposed costs, because of the appearance of high levels of income and wealth, managers will choose income–decreasing accounting methods. When considering the application of different standards that allow various policy choices, one can hypothesise about the reasons why managers select appropriate policies among the alternatives (Hunt, 1986). PAT suggests that the manager's choices may be influenced by particular firm attributes such as the existence of a bonus plan, leverage and size.

PAT attempts to understand why accounting policies matter and to predict the particular accounting policies that firms will choose. The theory is based on a view of the firm as a "nexus of contracts"; it argues that a business entity can be described by the various contracts it enters into and that these contracts help to understand why managers prefer certain accounting policies and oppose others (Watts and Zimmerman 1978; 1986). A number of studies rely on PAT to explain the relationship between firm specific variables and the choice of accounting method. (e.g. Hagerman and Zmijewski, 1979; Zmijewski and Hagerman, 1981; Lee and Hsieh, 1985; Press and Weintrop, 1990; Kuo, 1993; Gopalakrishnan, 1994; Sweeney, 1994; DeAngelo et al., 1994).

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[1] Positive accounting theory is a theory that attempts to explain the nature of accounting, the role and activities of accountants as well as relationships of accountancy to the economy.

These studies use multivariate regression techniques where the dependent variable represents an accounting choice and the independent variables represent the various firm–specific characteristics that are used as proxies for management compensation costs, debt contracting costs and political costs. The contributions of this research are numerous and include the discovery and the explanation of systematic patterns in accounting method choices, the recognition of the importance of contracting costs to accounting and the provision of a framework for understanding accounting choices (Watts and Zimmerman, 1990). The extensive use of contracts based on accounting numbers in firms and managers' perceptions about the impact of accounting figures on the valuation of their abilities by the external users of accounts can induce managers to assign a great deal of importance to the level of reported income.

A separate strand of research argues that a firm's ownership appears to be related to accounting choices and suggests that studies which have ignored ownership structure are incomplete and possibly misleading (Hunt, 1986). Thus, examinations of the potential relations between corporate ownership and accounting choices are necessary to provide a more complete theory of accounting choices and to assist in further development of a theory of the firm (Ibid). Thus far, the literature presents evidence suggesting that there is a relationship between ownership structure[2] and at least some accounting choices (Dhaliwal et al., 1982; Abdel Khalik, 1985; Hunt, 1986; Penno and

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[2] Most empirical studies distinguish between two types of firms: owner–controlled and management–controlled classes. Most researchers have defined the owner–controlled group as firms that have at least one shareholder (or related group, such as a family) who owns a certain minimum percentage of the ordinary equity (e.g. 10%). management–controlled firms have been defined as any firm not in the owner–controlled group; thus, they do not have any shareholder owning enough equity to achieve minority control (e.g.<10%). However, some researchers depart from their established criteria where evidence exists for categorizing a firm differently (e.g. Stano, 1976 cited in Hunt, 1986; Gadhoum and Zeghal, 2000). Mikhail (1999) provided a comprehensive discussion of how ownership concentration tests do not impose a uniform definition of "control" or take into account considerations peculiar to manager-controlled companies or have diffuse ownership.

Simon, 1986; Niehaus, 1989; Carlson and Bathala, 1997). However, this literature is limited by the manner in which ownership is measured as well as in the theorising of the link between ownership structure and PAT hypotheses.

PAT hypotheses which were formulated in the USA have been tested frequently in Western industrialised countries[3]. Ethnocentric studies seek to find out if theories that are applicable in one country apply to another in order to identify if the theories are universal or unique to one country (Gray, 1988). In addition, contingency theory and culture studies make use of countries to develop theories or test hypotheses about the functioning of accounting across the world or about the association between accounting and its environment (Hofstede, 1987; Gray, 1988; Doupnik and Salter, 1995; Nobes, 1998). Thus, one can argue that testing PAT hypotheses in a dissimilar environment provides an interesting contribution to our knowledge.

Within this chapter, the research issues being addressed by the present study are outlined. In addition, the basic elements of the research plan followed are presented. This chapter is divided into five sections. Section 1.2 introduces the motivations and the main research question of this project. Section 1.3 presents an overview of the study focusing on the basic aspects of the theoretical framework from which the hypotheses that are tested in this thesis have been derived. In addition, the research plan followed and the research methods employed are described. The potential contributions of the thesis to the existing accounting literature are explained in section 1.4. Section 1.5 outlines the structure of the thesis.

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[3] For a summary of this evidence, see for example Field et al. (2001).

## 1.2 Motivation and research question

PAT hypotheses were developed in the USA and have since been tested in many Western industrialised countries. According to contingency theory, however, managers' behaviour is influenced by the cultural and institutional environments in which they operate. Thus, it is possible that hypotheses that are well supported in studies of developed Western economies are not valid in emerging middle–eastern capitalist economies.

Contingency theory is an important subset of positivist approach to research in accounting, which suggests that it is essential to identify environmental variables that influence reporting practice (see e.g. Hofstede, 1987; Gray, 1988; Doupnik and Salter, 1995; Nobes, 1998). The United States has a highly developed equity market and a large investment analyst community that spends a great deal of effort and time in valuing securities. By contrast, Egypt's stock market is relatively small and the number of professional investors which monitor the movements in equity prices is relatively small. Thus, the conclusions from positive accounting theory studies in developed countries such as the USA may not apply within the Egyptian context.

Egypt provides an interesting environment for studying PAT hypotheses. Until the early 1990s it had a largely managed economy with a sizeable number of state–owned companies. Many of these organisations have gradually been privatised and the Cairo stock exchange has become more active as a result. Nevertheless, a majority of firms quoted on that exchange are primarily owned by small numbers of shareholders or families (World Bank Report, 2001). Within the economy as a whole, there are still significant numbers of relatively large businesses that are similarly closely owned and controlled. Furthermore, the government pursues taxation policies intended to

encourage the expansion of businesses that potentially provide employment to its citizens. These policies produce differing, and often extensive, periods of relief from business taxation. Within this context, successful business growth will probably be valued – indeed it seems to be rewarded by government agencies. Consequently, the conventional political cost hypothesis advanced by PAT may be quite inappropriate; this scenario provides an interesting possibility to be considered.

One can therefore argue that while it seems clear that economic self–interest and/or firm characteristics often motivate managers' accounting choice decisions in some Western countries, it is uncertain whether economic self–interest and/or firm characteristics dominate managers' accounting choice decisions in developing countries. Hence, the objective of this study is to provide evidence concerning the relevance of the main established PAT approach to accounting choices within the Egyptian context, a developing economy with a recently re–established capital market.

Based on this motivation, the current study seeks to answer one main research question:

- *Are major positive accounting theory hypotheses that are well supported in the USA and other developed economies valid in the Egyptian environment?*

This general question is further developed into three testable hypotheses derived from the fundamental hypotheses[4] of PAT initiated by Watts and Zimmerman (1978) and reviewed in Watts and Zimmerman (1986, 1990) (see Chapter 4). Each of these three testable hypotheses are then split into two sub-hypotheses based on the ownership structure of the firms being tested. Specifically, tests are performed for companies

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[4] Three fundamental hypotheses are presented in Watts and Zimmerman (1986) namely (i) the bonus plan hypothesis, (ii) the debt hypothesis and (iii) the size hypothesis. Theses hypotheses are outlined in detail in Chapter 3 of this thesis.

where the equity ownership is concentrated and those where shares are widely held. In particular, the research investigates whether PAT hypotheses apply differently in "owner-controlled" or "manager-controlled" firms because of the different agency relationships which may exist.

## 1.3 Overview of the study

Three hypotheses are derived from the PAT and will be tested on the accounting strategies of Egyptian corporations. Firstly, it is hypothesised that, *ceteris paribus*, managers of firms that employ executive bonus plans are more likely to adopt income–increasing accounting methods in order to affect wealth transfers from the firms' owners and shareholders; this hypothesis is derived from Watts and Zimmerman's bonus plans hypothesis. Prior research documents a strong empirical relationship between top executives' compensation and earnings (e.g. Sloan, 1993; Dechow, 1994). Top executives are responsible for the firm performance, including accounting earnings. To fairly reflect top executives' influence on firm performance, most firms relate earnings to top executives' compensations[5].

Secondly, the debt contracting costs hypothesis suggests that managers of firms that are closer to violation of debt covenants are more likely to make accounting choices which increase earnings in an effort to avoid the costs associated with renegotiations of debt contracts or bankruptcy. Because constraints on leverage

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[5] However, Hall (2002) documents that although the amount of stock price–based pay (as a fraction of total top executive pay) in 1990 was less than 10%, it had grown to about 30% by 1992 and over 60% by the end of the decade in the USA. The vast majority of this percentage was accounted for by increases in the use of executive stock options. In Egypt, the stock exchange is still developing and the number of actively traded companies is small relative to the number of sizeable firms operating in the country. Further, management bonus contracts are usually based on accounting earning (rather than share prices). This study does not therefore examine relationships between stock–based incentives and accounting choices.

(debt/equity) are often found in debt covenants, this variable is examined in this study. The level of financial leverage of a firm is used as a proxy for the firm's proximity to violating debt covenants (Duke and Hunt, 1990; Press and Weintrop, 1990; Sweeney, 1994). Consequently, it is assumed that the more highly leveraged firms are more likely to select an accounting policy that increases income.

A third hypothesis is derived from the conventional political cost hypothesis which suggests that managers of larger firms will seek to avoid the costs associated with the increased visibility which accompanies high earnings levels. Many researchers have implicitly assumed that very large companies may be viewed with suspicion, so that high rates of return could be perceived by outside observers as resulting from the unreasonable exploitation of external parties by the firm (Hagerman and Zmijewski, 1979; Daley and Vigeland, 1983; Cushing and LeClere, 1992; Aitken and Loftus, 1994; Han and Wang, 1998; Mikhail, 1999; Eilifsen et al., 1999). Such perceptions could result in government and regulatory decisions which are costly to the firm. By making accounting choices that influence accounting numbers, managers may influence the decisions of such parties. Managers of very large firms might therefore be less likely to use an accounting choice to increase earnings than are managers of smaller firms, since the former tend to be closely followed by outsider stakeholders such as trade union officials and powerful lobby groups. The latter may complain about "excessive profits" and " abuse of a dominant position" if profits increase at fast rate. Decisions which increase earnings may therefore be associated with important political costs, since the resulting increase in reported income is likely to be followed by an increase in taxation or other external intervention in the affairs of the firm.

These three hypotheses will then be examined separately for owner-controlled

and manager-controlled companies. Specifically, where owners monitor managers closely, no bonus plan may be employed to motivate executives who in turn may have fewer incentives to adopt increasing accounting choices. In contrast, for manager-controlled firms, bonus plans may be widely used to address the agency conflict between the goals of the shareholders and the aims of executives. In such circumstances, managers may have cogent self-interested reasons for choosing accounting alternatives which lead to higher reported earnings. In addition, the nature and/or level of debt and the importance attached to political costs may also vary from manager-controlled to owner-controlled firms. Thus, all three hypotheses will be examined for the two different owner-type companies.

It will be argued that, given the structural characteristics of Egyptian industry (see Chapter 2) political costs are not likely to give rise to the adoption of income–decreasing methods for the majority of firms operating in Egypt. However, the existence of management bonus schemes based on accounting numbers and the prevalence of accounting–based terms in debt agreements may lead firms to adopt significant income–increase accounting methods.

In brief, four basic characteristics of a firm have been hypothesised to influence the accounting choices of Egyptian companies[6]. These characteristics are: (i) the firm's ownership structure; (ii) whether a firm employs a management bonus plan; (iii) its leverage characteristics and its proximity to violating accounting numbers–based debt covenants and (iv) a firm's size variable which proxies for its political costs. Each hypothesis is divided to two subsidiary hypotheses concerned with the association between a firm's characteristics (independent variables) and the aspect of a firm's

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[6] In addition, anther five control variables are studied in this thesis: systematic risk (BETA), capital intensity (CI), concentration ratios (CR), profit (PROFIT) and the tax rate (TAXRATE) (see Chapter 5).

accounting policy decisions under investigation – depreciation and inventory valuation methods (dependent variables). Particular surrogates have been used for capturing the independent variables in this thesis based upon the data available in document–based databases as well as the information gathered via a questionnaire survey (see Chapter 5).

### 1.3.1 Methodology and analytical process

The empirical study follows most preceding work in the area by using an established database of financial information about firms quoted on the stock market concerned. Given the special features applying in Egypt, it also analyses data from an independent questionnaire survey. This methodological expansion enables mutual validation of, and challenge to, the findings from each independent source. It also allows the study to be extended to large firms that are not quoted on the stock exchange and to companies that are, on average, smaller than their quoted–company counterparts.

The research process of the current study involved: (a) a review of the literature; (b) an exploration of the relevant characteristics of Egyptian businesses, i.e. the financial and broader economic environment which according to the international accounting academic literature can have a serious impact on a firm's accounting policy decisions; (c) the formulation of hypotheses; (d) the development of empirical models; (e) the collection of data (via a Questionnaire survey and a Database) and (f) statistical analyses (descriptive statistics, correlations and tests of hypotheses).

The literature review was used to develop the main research question about how managers make decisions on accounting choices in the Egyptian businesses. In addition, the literature was employed to split the main research question into the three

testable hypotheses. Each of these hypotheses was then separated according to the ownership characteristics of the firms. Following previous studies in the area which have examined the economic consequences of accounting decisions, this study investigates the association between certain firms' characteristics based on published financial statements and their accounting policy decisions. However, not all financial statements of firms were obtainable. A database for only the most frequently traded equities on the Cairo stock exchange was available[7]. Consequently, this sample of database companies was biased towards businesses that were large and more widely held than most Egyptian firms. The researcher considered that information about smaller companies and about those with more concentrated ownership would enhance the analysis in this study. Such information was obtained from a questionnaire survey.

Thirteen interviews were conducted as a part of the pilot study for the questionnaire survey. The questionnaire was distributed to the financial managers of the 320 largest firms operating in the Cairo area, Alexandria and Menoufia; practical and theoretical considerations dictated the choice of the particular sample (see Chapter 5). The financial analysis was concerned with the annual reports published during the period 1999–2001. The financial statements of 118 of the most frequently traded firms listed on the Cairo stock exchange were collected. After excluding some companies because of data problems, the final sample includes 96 firms (see Chapter 5). No electronic databases on Egyptian firms' financial data exist; therefore, the details for all of the 96 firms were manually inserted into a database established for this study.

In the final stage of the investigation, the operational hypotheses were tested using statistical analysis of the database and the survey information. Both univariate

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[7] This study identifies the most frequently traded firms listed on two of the three sections of the Cairo stock exchange: (i) the "actively traded section" and (ii) the "rarely traded section".

and multivariate analysis were employed. In the univariate analysis, the relevant depreciation policy and inventory valuation policy choices were independently examined for any association with those firms' characteristics that had been hypothesised as being related to such a decision. The multivariate logistic regression analysis aimed to show the significance of the variables as a whole in the prediction of the dependent variable.

## 1.4 Potential contributions of the study

This study contributes to the accounting literature in several ways. First, this study tests and develops PAT's basic hypotheses in the Egyptian empirical context which – as far as this researcher is aware – has not been studied in the prior literature. Hence, the present study seeks to explain the accounting choice decisions of Egyptian firms on the basis of potential economic consequences of different accounting alternatives. This particular issue is interesting because important economic developments have taken place within the Egyptian business environment over the past ten years (see Chapter 2). It could be argued that these developments may have motivated Egyptian firms to become more concerned with accounting policy decisions. Thus the current study can contribute to our understanding of how Egyptian managers make decisions about accounting choice.

Second, the findings of the present thesis can provide a basis for further investigations of factors that may influence accounting policy decisions of firms operating in Egypt. The present study has provided evidence that some firm characteristics such as the employment of a bonus plan and the level of leverage may influence Egyptian firms' accounting policies. This study could be extended to include

additional variables by future researches in the area.

Third, the analysis of this thesis introduces the notion that PAT hypotheses may be influenced by the ownership structure of the firms being examined. In particular, the thesis considers whether the different agency relationships which exist in owner-controlled and manager-controlled companies impact on managers' choices about accounting policies. To date, this possibility has not been extensively researched in the existing PAT literature; these tend to focus on US or UK companies which all tend to differ from the classic agency problems associated with the separation of ownership from control.

Fourth, the model used in this study could be used to study other accounting policy choices and the accounting decisions of companies in other developing countries. Thus, the present investigation may act as a catalyst for additional research both in Egypt and in other developing countries. There is a dearth of empirical research on accounting choices by managers in developing countries where data availability and access to companies can be problematic. This thesis may encourage other researchers to grapple with these difficult problems and address important questions in their own native countries

Fifth, the findings of the current thesis may also be of interest to legislators. Understanding the potential motivations that influence a firm's accounting policy decisions could facilitate the design of legislation designed to achieve the Egyptian government's policy–related objectives. Moreover, for owners, shareholders and other external users of published annual reports, knowledge of the possible reasons why a firm makes certain accounting policy decisions can be of some value. If financial statements are one of the major information inputs in users' decision making (Pike et al., 1993; Al–Abdulquader, 2003), then an understanding of what motivates the

preparers of annual reports to take decisions which increase reported income may be useful; this is especially true when capital markets may not be informationally efficient (Fama, 1970). Finally, financial analysts and others with an interest in capital markets may be concerned about a firm's accounting policy decisions and the consequences for the level of reported income.

## 1.5 Thesis organisation

The remainder of this thesis is organised as follows. The Egyptian context and the main structural characteristics of the economy as well as the financial reporting requirements of the country are discussed in Chapter 2. Chapter 3 presents the theoretical framework which underpins this study. Moreover, the findings of earlier pertinent research are reviewed and the main research question for this study is presented. Based on this analysis, the testable hypotheses that have been developed for the purposes of this study are presented in Chapter 4.

The research design and methodology utilised to test the hypotheses as well as the data sources, variable definitions and measurements assumptions are described in Chapter 5. In addition, the assumptions underpinning the different statistical techniques employed are also presented in this chapter. The reasons for the selection of the particular research methods adopted in this study are explained so that the reader can follow the thinking of the researcher.

The empirical results of the statistical analyses are presented in Chapter 6 and Chapter 7. Chapter 6 presents the descriptive statistics and examines the association between certain variables obtained from the questionnaire survey and the variables extracted from the financial statement analysis. In Chapter 7, the empirical findings of the formal statistical analyses for testing the hypotheses are reported and interpreted.

Finally, Chapter 8 contains a brief summary of the study and outlines the conclusions drawn from the results. A discussion of the limitations of the study is provided in that chapter and the implications for future research are considered.

# Chapter 2: The Egyptian Context

## 2.1 Introduction

Egypt is a leading nation in the Middle East and North Africa, being the oldest and most populous country in the Arab world. The Public Enterprises Sector (PES) in Egypt was established as a result of a sustained period of nationalization and centralized state control introduced between 1952 and 1974. The foundations of liberalization were laid in 1974 when laws to open up the economy to foreign investment and protect investments against nationalization and confiscation were introduced. Little was done, however, to weaken state control over the economy. Throughout the 1970s, businesses were highly protected, inward–looking and dependent on imported inputs (Harik, 1998). During the 1990s, however, Egypt pursued successful macroeconomic stabilization policies and also initiated structural reform programmes to put the country onto a high growth path.

Understanding the factors that shape the broader economic, business and political environment prevailing in a certain country can facilitate the comprehension of the business practices adopted by firms in that country (Nobes, 1991). Moreover, Tarca, (2002) indicates that factors which impact on the selection of accounting policies to be used in the preparation of the firm's financial statements include national law and stock exchange rules as well as competitive market pressures. Thus, the prevalent business environment, the level of economic activity, the development of national laws and the status of the stock exchange rules as well as culture may explain the accounting policies that are adopted by companies.

This study aims to test PAT predictions in the Egyptian environment. The purpose of the present chapter, therefore, is to outline and discuss the distinctive characteristics of the broader business and economic environment which prevailed in

Egypt throughout the period examined in this work. The discussion in this chapter therefore should provide a background against which the remaining analysis in other chapters could be evaluated.

The remainder of this chapter is split into five sections. The next section summarizes the Egyptian business environment. Section 2.3 discusses the current state of the public enterprises sector in the Egyptian economy during the period between 1952 and 1992. Section 2.4 includes a chronology of events associated with the economic reforms in Egypt. Section 2.5 discusses the potential of contingency theory to explain accounting practice in Egypt. The chapter concludes with section 2.6, where a synopsis of the main structural characteristics of the business, financial and economic environments within which Egyptian firms operate is provided.

## 2.2 The Egyptian business environment

There are some features which distinguish the business environment in Egypt from those typically observed in Western countries. In Egypt, the size of the domestic market for manufactured products is relatively limited. Egypt's economic reforms and capital market developments therefore sought to encourage investment in export–orientated companies and to build up the skill base (and hence the disposable income) amongst the population. Rates of education for technicians and scientists are high in Egypt. Many have argued that flexibility in production and business processes as well as the ability to absorb new technologies is directly related to the stock of indigenous human capital (e.g. Wollganf, 1996). The government estimates unemployment at 7% in 2001. However, most outside observers believe that this figure is low, placing unemployment, in the identical period, closer to 12% (World Bank Indicators, 2001). Unemployment is also a problem because the private sector is still not sufficiently

developed to accommodate the rapidly expanding workforce and the government has long been overburdened by its self–imposed role as the employer of last resort. Skill levels compound these difficulties. The education system remains stretched and is thought to have room for improvement in terms of its ability to provide workers with the technical skills that a private sector economy demands (Harik, 1998).

### 2.2.1 Stock markets

The Egyptian stock exchange (ESE) is one of the oldest in the world and comprises two exchanges: the Alexandria stock exchange (ASE) which was officially established in 1888 and the Cairo stock exchange (CSE) which was established in 1903[8]. The ESE was the fifth most active stock exchange worldwide prior to the nationalization of industry and the adoption of central planning policies in Egypt during the early 1950s. Thereafter, the ESE remained inactive for about 30 years. The policies of nationalisation and central planning led to a considerable reduction in stock exchange activity. The ESE was re–established again as a market for the raising and exchange of equity capital during the 1990s.

The re–establishment of the Egyptian stock market in the 1990s was a part of the general process of deregulation and privatisation in the economy. These reforms played an important role in promoting the stock exchange as a channel for divesting public enterprises through public stock offerings and as a venue to enable the private sector to raise capital. A new capital market law[9] was key to this process, as it defined the

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[8] The Cairo and Alexandria stock exchanges have competed with each other since their foundation. In recent years, the two exchanges were integrated. They are now governed by the same board of directors and they share the same trading, clearing and settlement systems, so that market participants have access to equities listed on both exchanges.

[9] Capital Market Law No. 95/1992.

regulatory framework for financial intermediaries, established the Capital Market Authority (CMA) as an independent regulatory agency for the securities industry and strengthened investor rights and financial disclosure requirements.

The central role of a stock market is to enhance the mobilization of savings and the provision of equity capital to the corporate sector, as well as to promote efficient investment choices through continuous monitoring of share prices and the possibility of mergers and acquisitions (Fahmy, 1998). Egypt's stock market appears to have been successful in fulfilling this role since recent changes have been introduced. For example, in September 1996, the International Finance Corporation (IFC) added the Egyptian daily index to its database. The index comprises 32 of the most actively traded shares on the exchange. This move has increased confidence in the financial environment and hence encouraged more capital inflows[10].

Each of the two stock exchanges (in Cairo and Alexandria) has listing rules, including requirements relating to the presentation of financial information that apply to companies trading on the ESE. Therefore, stock exchange requirements can influence a company's decision about the accounting policies to be followed. In this way, a stock exchange listing can impact on domestic policy choice. In Egypt, a sizeable number of companies are listed on the ESE; these are subject to the disclosure requirements of the exchange and the CMA.

The Capital Market Authority Index (CMAI) started on January 1992. The index includes all listed shares weighted in relation to the size of their issue. As such, the index covers the broadest base of equities although trading is concentrated in a considerably smaller number of shares. As of the end of March 2003, there were 1,151

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[10] Source: Capital Market Authority, (Cairo: CMA, issues 1997–1998).

companies listed on the ESE. In Egypt, a large tax advantage is given to companies listed on the exchange. Article 120 of the Tax Law 157/1981 stipulates that all joint–stock companies, public or private, that are listed on the stock exchange, are tax exempt up to the equivalent of the Central Bank of Egypt (CBE) deposit rate (currently about 9.25%) on their paid–up capital. In other words, taxes are only charged when the rate of return is above the market rate of interest. The magnitude of the subsidy has led to a many closely held companies being listed. Consequently, the ESE identifies listed companies as either (i) actively traded or (ii) rarely or not traded[11].

### 2.2.2 Business income taxation

Egypt applies relatively high and non–uniform tax rates on profits. The maximum corporate income tax rate in Egypt (40%) is high compared with other developing countries (Kheir–El–Din et al., 2000). Tax rates vary according to the nature of the firm's activity. For corporate firms engaged in services, the maximum rate is 40%, whereas the rate for corporate firms undertaking manufacturing and exporting activities is only 32%. Like corporate taxation regimes elsewhere, the tax law in Egypt provides different forms of deductions and allowances[12]. These include annual deductions to compensate for the deterioration of assets set by reference to rules established by government, as well as initial allowances granted to investment in new machinery[13]. For

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[11] Stock market developments are discussed in section 2.4.2. In addition, descriptive statistics about Egyptian capital market over the period 1990–2002 are presented in Table 2-2.

[12] For a fuller description of the various deductions and allowances given, see Kheir–El–Din et al. (2000).

[13] In Egypt, the corporate tax base would be, in principle, the following:
$Y = R - C - Dep - INT$
where: $R$ is revenues, $C$ is current costs (salaries and material expenditures), $Dep$ is economic depreciation (and depletion) of assets (evaluated at the cost of replacement) and $INT$ is interest paid for borrowed capital (see El–Samalouty, 1999).

comprehensive income tax, the corporate tax uses the term of "economic depreciation" of assets evaluated at the cost of replacement (El–Samalouty, 1999); these are instead of the depreciation charges shown in the accounting earnings. Thus there is a significant difference between the tax affects of depreciation, which has no taxation implication, and inventory accounting policies, which directly affect the amount of tax paid. In addition, the tax law allows for the deduction of interest on debt from taxable income. There are also special allowances granted to certain organizational forms, such as allowances related to the paid–up capital granted to joint stock companies listed on the stock exchange, which were identified in section 2.2.1.

In Egypt, tax incentives can be conveniently grouped into two categories: first, tax holidays handed out under the recently issued Investment Law No. 8/1997 by the General Authority for Investment (GAFI)[14] and second, investment incentives available to all firms under the general income tax code. There are, in addition, other selective incentives directed at specific kinds of firms. The investment law authorizes GAFI to award tax holidays to any entity, regardless of their legal form, involved in: the reclamation and cultivation of barren or desert lands; animal, poultry and fish production; industry and mining; hotels, tourist villages; as well as tourist travel and transport. Also, current Egyptian tax law sharply discriminates among different types of investments, not only by sector and the type of financing, but also according to their organizational form. Corporations, especially joint–stock companies, are taxed relatively lightly in comparison to non–corporate forms of businesses, except when financed by retained earnings (Kheir–El–Din et al., 2000).

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[14] Law No. 8 of 1997 on Investment Guarantees and Incentives was issued by GAFI, which superseded, Law No. 230/1989, and also unified a number of articles concerning investment incentives in a number of laws: namely, Law No. 59/1979 on New Urban Communities, Law No.1/1973 on Hotels and Tourist Establishments, and Law No.95/1995 on Financial Leasing.

The tax provisions in the Egyptian law that favour joint–stock companies over other forms of organization include[15]:

- Joint–stock companies may deduct the imputed cost of paid–up capital financing from taxable earnings.
- Joint–stock companies have lower annual stamp duties on share capital compared to other businesses.
- Joint–stock companies only pay tax on 10% of dividends received from other companies, while other types of companies and businesses are taxed on 100% of dividends received.
- Only a joint–stock company can claim a five–year tax holiday if it has 50 employees or more.

Investment incentives are a prominent feature of the Egyptian tax policy and the preferred form is tax holidays. Egypt uses tax holidays to promote certain activities and to encourage new industries. Tax holidays vary from between 5 and 20 years and extend to lifetime exemptions from taxes in the case of free–zone investments[16]. Several laws[17] govern the exemption pattern in addition to exemptions contained in the tax legislation itself.

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[15] See the Egyptian tax law 157/1981.

[16] Law No. 8 of 1997 governs the tax–free investment zones. There are two types of tax–free zone: public free zones and private free zones. Private free zones are for a specific project or company; these accommodate storage, warehousing, handling and repackaging, assembly, and manufacturing for exports and services activities. Currently, there are seven public free zones established by the General Authority for Investment. Investment in tax–free zones have incentives as life–time tax exemption and exemption from import and capital goods duties, and can enjoy the absence of restrictions on exports.

[17] For example, see Law No. 8 of 1997 (The Investment Incentives and Guarantees Law), Law No. 159 of 1981 as amended (The Companies law) and Law No. 59 of 1979 the (New urban Communities Law).

### 2.2.3 Disclosure in Egypt

In spite of disclosure being critical to good corporate governance, disclosure runs against many traditions in Egypt. All corporate information has traditionally been thought of as "secret"[18]. As in many countries, financial managers were assumed to keep many different sets of financial records: one for the "owner", one for tax inspectors and one for outside investors[19]. However, the capital markets development in the past few years have resulted in several important reforms:

- The capital markets law requires quarterly financial disclosures in accordance with Egyptian Accounting Standards (EASs). Disclosure is also stipulated in the listing rules of the ESE. Rules require all listed companies to publish audited quarterly financial statements adhering to international accounting standards (IASs). Companies are also required to make timely disclosure of all material news that may affect their businesses and earnings.
- Egypt has essentially adopted IASs as the national reporting framework for businesses. EASs are the same as IASs, with some minor exceptions.

Recently, the exchange has issued new listing rules to address many of the deficiencies in the existing requirements. The new rules state that companies must disclose information about voting rights, the existence of large shareholders (with 3% or more of the equity), voting rights restrictions, shareholder coalitions and banking relationships. A new Egyptian stock market law issued in August 2002 requires all listed firms to disclose full financial statements on a quarterly and annual basis. Firms

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[18] Source: Five interviews with the chairmen of investors associations in five industrial cities in Egypt confirmed this widely held view that most companies behave as if information about their performance belongs to the firm and should not be disclosed without a good reason.

that do not comply will be removed from the exchange. Indeed, from August 2003 the ESE will enhance its on–line electronic surveillance system for all listed firms to allow investors to get easy access to information and to highlight the identity of non–disclosers; this development is seen as an additional incentive to report regularly. The new stock exchange listing rules therefore require a new level of disclosure, including details about the "governance" (e.g. ownership structures) of firms.

### 2.2.4 Corporate governance and board structure

At a formal level, the corporate governance framework in Egypt appears similar to that which operates in many developed countries: e.g. shareholders vote at annual general meetings, boards of directors meet and companies restructure within the competitive capital market environment (World Bank Report, 2001). However, the need for corporate governance reform remains urgent and, although much has already been done, Egypt still has some distance to go (see Privatisation Coordination Support Unit (PCSU), 2000). Where and how far is indicated by a comparison of its present corporate governance policy framework with an emerging international consensus that shareholder value should be the goal of good corporate governance.

Currently, the principles of corporate governance are gaining widespread support in Egypt. Also, steps have been taken to ensure that Egyptian companies comply with principles of OECD governance. The current corporate governance system in Egypt provides respect for: (i) stakeholder rights that are protected by contract or specific laws, such as the labour act and the environmental law, (ii) employees that have the right to be represented at board meetings through the Employees Shareholders

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[19]This is related to the level of disclosure only but the accounting methods must to be the same.

Association (ESA) and (iii) increasing stakeholder access to information and greater redress for the violations of their rights (see PCSU, 2000).

Regarding the ownership/control structures, companies are legally obliged to maintain an updated register of shareholders; they must make such a list available to the corporate governing bodies. Mergers and acquisitions are strongly controlled by Corporate Law 159, which stipulates that any person intending to launch an acquisition resulting in ownership of at least 10% of capital must give the company two weeks notice via registered mail. The ownership required to call shareholders meetings is 5% for ordinary meetings and 10% for extraordinary meetings (see World Bank Report, 2001).

On the other hand, the boards of Egyptian companies do not seem to meet international standards for overseeing the actions of management. Egyptian companies appear to share several characteristics which are not present among companies in developed countries[20]. First, independence is rare or non–existent among directors on boards of companies. Many of the board members are major shareholders. Boards therefore tend to be driven by strong managers or owners and there is very little oversight or monitoring of their decisions. Second, there is often some confusion between board and management roles. More fundamentally, there appears to be a lack of separation between the role of management and the role of the board executive. The chairman tends to be the managing director and many of the board members are both major shareholders and managers. Finally, corporate governance problems for holding companies tend to be especially acute. The lack of oversight is particularly serious for subsidiaries of large holding companies. Many of these subsidiaries are publicly traded

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[20] For a fuller description of these characteristics, see PCSU (2000).

companies with separate boards and governance structures. However, the board may have no real authority. Decisions about pricing, strategy and marketing are made at the holding company level. Expropriation due to low transfer prices or the movement of assets between subsidiaries is currently almost impossible to recognize or control. In many cases the majority shareholder at the subsidiary level and the majority shareholder at the holding company level are the same. Thus majority shareholders are not affected by inter–company accounting (see PCSU, 2000).

The World Bank Corporate Governance Report (2001) uses the standards of the Egyptian corporate governance system to evaluate Egypt's market and regulatory framework, emphasising the pre–eminence of shareholders' rights and the mechanisms for overseeing management. One can summarize the conclusions of this report as follows (see appendix 1-1):

a. The Egyptian corporate governance system is framed by French civil law for corporations; Sharia law has no direct influence on corporate governance.
b. There is one stock exchange with two trading floors: the CSE and the ASE.
c. Capital markets law guarantees basic shareholder ownership rights, minority shareholder rights and the basic governance processes and procedures.
d. The report highlights a number of areas where the Egyptian corporate governance system needs strengthening. These can be grouped under six headings: disclosure of ownership and control structures; disclosure of financial and non–financial information; training and capacity building for regulators and the private sector; the role and effectiveness of shareholders' meetings; practices of boards of directors; the professional conduct of auditors.

## 2.3 The public enterprises sector in the Egyptian economy before the reform programme 1952–1992

Generally, the term "public enterprises sector" (PES) is used for organizations that operate with publicly owned capital, whether nationally or locally. Accordingly, the PES includes units established by public capital whose activity contributes to the achievement of targeted economic and social development. After the revolution of July 1952, the Egyptian government was keen to play a more active role in the economy through projects that directly affected the development of the national economy. These included the establishment of an iron and steel company, a company for fertilizers and chemical production as well as a company for construction and public buildings. The Suez Canal Company and other French and British companies were also nationalized.

### 2.3.1 Performance of the PES in Egypt

Entities within the public enterprises sector were historically established as large entities. Each entity possessed substantial assets and employed large numbers of workers. Most of these public sector entities have factories located throughout the country and all operate under one parent company. Consequently, it was difficult to manage and control the financial performances of these entities because of the bureaucratic structures in place and the government influence on the decisions that were taken. They tended to perform poorly because of overstaffing and a chronic shortage of funds (PCSU, 2001). The decision to transform these public entities into private enterprises was taken in order to improve the economic development in the country.

Performance indicators from studies of the financial reports of public sector companies showed the need for a comprehensive reform of the PES in Egypt (see PCSU, 2001). First, the rate of profit on invested capital for such entities decreased from 8.0% in 1975 to 5.9% in 1988, while the average interest rate in 1988 was around 14%. Second, debts and other financial burdens on the PES gradually increased. Debt increased relative to total invested capital, from 30.3% in 1975 to 74.3% in 1988. This led to aggregate losses over the period 1975 to 1988 reaching around £E 24.780 billion; by the end of 1988 total debt reached £E 80 billion[21].

In 1991, with the begining of economic reform, the performances of the all public units were evaluated; some 399 large entities were scrutinised. This evaluation clarified that the average rate of profit on total invested capital was 6.39% at the end of the 1991 financial year; this percentage was down from 6.35% a year earlier. Moreover, the number of these companies in financial difficulties reached 85 out of the total of 399 (representing 21% of the population firms) including 62 loss–making companies (15.5% of the firms examined)[22]. Since economic development was based mainly on enlarging the role of the PES, the deficits of these companies threatened the growth of the economy since profits were not available for reinvestment and expansion. In addition, deteriorating balance sheets meant that further borrowing was not an option for these companies as financial institutions were unwilling to extend credit[23] (PCSU, 2001).

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[21] For a fuller description, see PCSU (2001).

[22] Source: The Egyptian Ministry of Public Enterprises Sector, (Cairo: MPES, various issues).

[23] This is evidenced by the fact that (a) the general balance sheet deficit was almost 10% in 1952, but reached 18.9% during the period 1960–1973 due to the state's increasing role in the economic activity, and (b) during the period 1983 to 1991, the deficit ranged from 18.3% and 21% and lead to a peak in the fiscal year 1987.

In the early 1990s, the government of Egypt began implementing liberal policies to transfer some of the responsibility for economic growth to the private sector. One of the central goals of any privatisation transaction is the transfer of a state owned economic asset to new owners in the private sector. Transfer of ownership, or majority privatisation, usually refers to having 51% or more of the equity in a government enterprise sold to the private sector; in these transactions different types of ownership emerged[24]. The state has, however, retained a substantial ownership in the equity of many privatised companies. Adopting this definition of "privatisation", the Egyptian government has implemented majority privatisations in 142 enterprises to date; ownership of these enterprises has been transferred to the private sector and the government is no longer involved in the internal business affairs of these companies[25]. However, there is presently very little information available about the post privatisation development for companies which were sold off by the Egyptian government. It is still difficult to establish whether the privatised enterprises have indeed become separated from the state after their privatisation.

The separation of management and ownership allows managers and the capital providers to specialize in what each is thought to do best (Omran, 2001). However, as corporations (especially publicly traded ones) grow, they need to achieve a balance between giving directors and management enough discretion to run the company and making them accountable to shareholders and other corporate stakeholders.

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[24] Such types of ownership include (i) initial public offerings; (ii) sales to anchor investors; (iii) employee stock ownership programme and (iv) liquidation. The government launched a privatisation programme with Public Enterprise Law 203 of 1991 and executive regulations establishing the regulatory framework for the sale of some state owned enterprises. The Public Enterprise Office is responsible for advising on the sale of companies according to Law 203 companies. The law permits sales to foreign entities.

[25] Source: The Egyptian Ministry of Public Enterprises Sector, (Cairo: MPES, various issues).

Privatisation has resulted in a new economic environment which may affect the performance of all Egyptian firms, both private and public (Ibid, 2001).

## 2.4 A chronology of events

The first step in the recent reform programme involved the increasing of interest rates above 20% and a reduction in government spending. At the same time, government revenues grew quickly partly due to a more efficient tax collection system and a higher local currency valuation of US dollar revenues from petroleum exports and Suez Canal income; this followed the devaluation of the Egyptian pound in 1991. In addition, revenue from the privatisation of public entities helped to improve government finances. The government implemented the first phase of a comprehensive Economic Reforms and Structural Adjustment Programme (ERSAP) from the Spring of 1990 up until the Winter of 1993. A second phase of the ERSAP started in July 1993. As a result, the government was able to reduce its deficit from 15.5% of GDP in 1990 to 0.9% of GDP in 1997.

**Table 2-1 Descriptive statistics about Egyptian economy**

| Economic Indicators | 1994 /95 | 1995 /96 | 1996 /97 | 1997 /98 | 1998 /99 | 1999 /00 | 2000 /01 | 2001 /02 |
|---|---|---|---|---|---|---|---|---|
| Nominal GDP at market price (LE billions) | 204 | 229 | 256 | 280 | 302 | 337 | 359 | 382 |
| Real GDP at market price (LE billions) | 156 | 164 | 173 | 271 | 287 | 302 | 320 | 330 |
| Real GDP growth rate (Per Capita) | 2.5 | 2.9 | 3.4 | 3.7 | 3.7 | 3.0 | 3.4 | 3.2 |
| Share of private sector in GDP | 64.3 | 65.5 | 68.8 | 70.7 | 74.9 | 73.1 | 71.4 | 71.1 |
| Unemployment rate | 9.6 | 9.2 | 8.8 | 8.5 | 8.2 | 7.9 | 7.1 | 7.0 |
| Average annual inflation | 9.4 | 7.3 | 6.2 | 3.8 | 3.8 | 2.8 | 8.3 | 9.0 |
| Nominal interest rate | 10.1 | 9.5 | 9.8 | 8.8 | 8.82 | 9.09 | 9.09 | 7.8 |

Source: Central Bank of Egypt, The Egyptian Cabinet Information and Decision Support Centre, (Cairo: CBE and IDSC, Various issues, 1994 –2002).

The combination of fiscal and monetary controls resulted in a reduction of inflation from 21.7% in 1990 to its current level of 9%[26] (see Table 2-1). Privatisation continued to be a central aspect of the government's economic reforms and a further group of state–owned entities was sold in 1996. The government sold, either fully or partially, 159 companies during 1996–2002; only 30 companies were privatised between 1991 and 1995.

### 2.4.1 Privatisation

The privatisation process was intended to sell 30% of all non–financial public enterprises in 1996/1997 and to dispose of the remainder in 1997/1998. Shares of the newly–privatised companies were then traded on the ESE. Not all sectors were subject to privatisation. Some privatisation occurred in the tourism and the agriculture sectors. However, all the large public enterprises remained state–controlled in the petroleum sector, the National Airline and the Suez Canal Authority. The privatisation programme has been essential for the development of the capital market as the number of securities being traded as well as the appetite of investors for equities has increased. Further, the privatisation process has allowed domestic fund managers to include Egyptian equities from a number of sectors in their portfolios. Privatisation has increased the relative importance of the stock market to investors and shareholders and has also introduced a new dimension to the investment returns of Egyptian shares (see PCSU, 2002). The demand for securities by international investors should increase the standard of corporate reporting demanded by shareholders including the requirement that financial statements should be audited by high quality external auditors. While, the emphasis

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[26] Source: Central Bank of Egypt, The Egyptian Cabinet Information and Decision Support Center. (Cairo: CBE and IDSC, Various issues, 1992–2002).

before economic reform was on information needed for economic planning at the macro level, the emphasis after economic reform has been on financial accounting and auditing. Another difference post–privatisation is the relative emphasis on income measurement. After the economic reforms were introduced and with the majority of businesses now being privately owned, income determination was of prime importance; before the economic reforms, this was not the case because government ownership dominated decisions (Jaruge, 1991). Using privatised companies quoted on the CSE, Omran (2001) found significant improvements in profitability, operating efficiency, capital expenditure and dividends. On the other hand, he finds significant decreases in employment and leverage. Output also decreased following privatisation but this change was not significantly different from zero.

### 2.4.2 Monetary and stock market developments

Stock market activity was low during the 1992–93 period recording a turnover ratio of about 5%. But this was followed by rise in activity to an average of 15% in 1994–95. Capital inflows picked up again in 1996/97 as the privatisation programme gathered pace; thus the programme played a significant role in activating the Egyptian stock market. The market experienced a significant rise in its performance and most market indices recorded new highs achieving a return of about 52% in 1996–97. Total traded volume during the period 1996–97 increased threefold to reach 580 million shares; this compared to a total traded volume of 179 million shares during the period 1992–95. Similarly, the total value of equities traded during 1996–97 increased to £E 35 billion which was equivalent to about five times the total traded value during the period 1992–95. Thus, market activity reached its peak recording turnover ratios of 23% and 34% for 1996 and 1997 respectively (see Table 2-2).

Despite some strong fundamentals, stock market performance declined in the second half of 1997, due to three exogenous shocks: (i) the South East Asia emerging market crisis (Lonie et al., 2001); (ii) a significant fall in oil prices (Sourial, 2002) and (iii) the Luxor attack (Ibid). These factors resulted in a deterioration in the external position of the country and capital account shifted into deficit. During the period from December 1999 to January 2000 interest expenses for borrowers increased resulting in a weakening in borrowers' financial positions. Also, customers' spending declined with delays in debt repayments, which resulted in an erosion in corporations' net worth and a decline in creditworthiness. In response, banks started to reduce their lending activity putting further pressures on the real activity of the corporate sector. This deterioration had a negative impact on the stock market such that, in the first half of year 2000, the stock market was volatile[27]. The market started 2000 with an aggressive rise. Most indices achieved high growth levels similar to those in 1997, while the CMAI reached a new record high on February 14th, 2000 of 695.4 points. This surge was followed by continuous decline in all of Egypt's indices by almost 30%. Total market capitalization dropped to a low of £E 120 billion (36% of GDP) after reaching the highest level £E 139 billion (42% of GDP) during January 2000.

Looking at the overall picture over the two phases of the economic reforms as well as the structural adjustment programme in Egypt, the changes have resulted in significant domestic reforms and dramatic increases in foreign investment, foreign trade and joint–venture enterprises with foreign companies.

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[27] Source: Capital Market Authority, Annual Report, (Cairo: CMA, various issues).

**Table 2-2 Descriptive statistics about Egyptian capital market over the period: 1990–2002**

| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of companies listed[1] | 573 | 627 | 656 | 674 | 700 | 746 | 646 | 650 | 861 | 1033 | 1076 | 1110 | 1153 |
| New issues (L.E billion)[2] | N/A | N/A | N/A | N/A | N/A | 11 | 20 | 20 | 35 | 56 | 20 | 11 | N/A |
| Annual total return % | N/A | N/A | N/A | N/A | N/A | -11.1 | 33.0 | 18.9 | 6.2 | 49.0 | 0.3 | -2.1 | 0.63 |
| Market capitalization (L.E billion) | 5 | 9 | 11 | 13 | 14 | 27 | 48 | 71 | 83 | 112 | 120 | 111 | 120 |
| In percent of GDP | 3.8 | 6.7 | 8.2 | 7.4 | 7.2 | 13.4 | 21.0 | 27.7 | 29.9 | 34.4 | 35.6 | 30.2 | 30.8 |
| Value of trading (L.E million) | 341 | 428 | 596.7 | 569 | 2,557 | 3,849 | 10,968 | 24,220 | 23,363 | 42,056 | 54,012 | 31,796 | N/A |
| a) Listed shares and bonds | 206 | 234 | 371.4 | 275 | 1,214 | 2,294 | 8,769 | 20,282 | 18,500 | 35,821 | 45,789 | 24,660 | 20,422 |
| b) Unlisted shares and bonds | 135 | 194 | 225.3 | 294 | 1,343 | 1,555 | 2,199 | 3,938 | 4863 | 6,235 | 8,223 | 7,136 | N/A |
| Volume of trading (million) | 17.0 | 22.7 | 29.6 | 17.7 | 59.8 | 72.2 | 207.7 | 372.5 | 570.8 | 1,074 | 1,108 | 1,260 | N/A |
| a) Listed shares and bonds | 14.3 | 19.2 | 20.7 | 13.7 | 29.3 | 43.7 | 170.4 | 286.7 | 440.3 | 841.1 | 1,029 | 1,184 | 1,069 |
| b) Unlisted shares and bonds | 2.7 | 3.5 | 8.9 | 4.0 | 30.5 | 28.5 | 37.3 | 85.8 | 130.5 | 233.0 | 78.7 | 76.0 | N/A |
| Number of companies traded | 199 | 218 | 239 | 264 | 300 | 352 | 354 | 416 | 551 | 663 | 659 | 643 | N/A |
| As % of total listed companies | 34.7 | 34.8 | 36.4 | 39.2 | 42.9 | 47.2 | 54.8 | 64.0 | 64.0 | 64.2 | 61.2 | 57.9 | N/A |
| Turnover ratio[3] | 6.7 | 4.8 | 5.5 | 4.4 | 17.7 | 14.0 | 22.8 | 34.2 | 22.3 | 31.9 | 38.2 | 22.1 | 17.1 |

Source: Capital Market Authority, Annual Report, (Cairo: CMA, various issues).

1\ At year end.

2\ Shares and bonds.

3\ Value of trading listed securities as a share (in percent) of market capitalisation.

As such, it has been argued that they have been successful. Moreover, this success has led to the need to modify the current accounting system to meet the new economic situation which has emerged.

The accounting profession in Egypt is still growing and new accounting standards are being introduced where none existed. They usually represent the adoption of standards found in the developed countries without proper consideration of the relevance of such standards to an Egyptian setting. For example, EASs are close to IASs, except with respect to financial leasing[28] and the treatment of pension costs.

## 2.5 Contingency theory and accounting practice in Egypt

Ethnocentric studies determine whether the accounting systems used in one country are applicable or used elsewhere; they seek to find out if theories that are applicable in one country can be used in another to identify if the theories are universal or unique to a single location (Gray, 1988). The most common approach of ethnocentric studies is replication (Adler, 1983). With replication, the main purpose is to confirm that the theories under investigation appear to explain some activity in another setting. In addition, contingency theory studies (Doupnik and Salter, 1995) and culture studies (e.g. Hofstede, 1987; Gray, 1988; Nobes, 1998) identify reasons at a macro level that are likely to cause differences in the accounting practices employed in various countries. Contingency theory hypothesizes that organizational structure is a function of context; the context is, in turn, determined by the external environment, the history and other organizationally determined factors. Contingency theory based

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[28] The Government and the profession have taken significant steps to close the gap between EASs and IASs. Except for lease accounting, EASs were developed in conformity with IASs. The legal requirements concerning leases in Egypt do not recognize finance leases and the application of accounting treatments required under the relevant international standard.

studies make use of countries to develop theories or test hypotheses about the functioning of accounting across the world or about the association between accounting and its environment (Gray, 1988). A characteristic of the contingency type of study is the cross–sectional examination of data on a sample of countries at a point in time and cross–time analysis of data over a period of time. However, contingency theory also examines how and why bureaucratically rational systems of control become transformed when political factors predominate. This type of research requires one to discern which of the many differences between countries are the relevant analytic variables (Belkaoui and Maksy, 1985).

There is an increasing recognition among researchers that accounting is not an autonomous phenomenon; other social, political and economic factors are seen as being able to provide explanations for accounting changes, often playing a significant role in influencing the course of its transformation (Hopwood, 1987). People in different cultures differ in their views and in their reactions to managerial practices. So particular cultural conditions often impact on the effectiveness of managers. Culture has been shown as a major factor affecting the structure of business, society and accounting (Hofstede, 1987; Gray, 1988). Hofstede (1987) defined "culture" as a collective programming process by a society, which is different from other societies because of the different belief systems of its members. He has investigated various cultural differences across countries. Building upon this pioneering work, O'Connor (1995) and Goddard (1997) found a contingent relationship between corporate and hierarchical culture and budget–related behaviour. Gray (1988) argues that accounting systems differ internationally because culture differs from nation to nation. However, Briston (1990) has argued that many developing countries with different cultures, religion, social, business and political environments have been "pressured" into adopting

Western conventional accounting principles; they use "Western" standards and their underlying philosophy without any or only negligible modification.

As discussed earlier, Egypt has long–establish stock markets but they became inactive for 30 years. The re–activation of the Egyptian stock market started in the I990s but commentators believe that the stock market is still inefficient (Kantor et al.. 1995). Despite such inefficiencies, Egypt is attempting to build a modern business infrastructure within the constraints of limitations in available social and physical resources. Egypt shares the common link with other countries in the region of an Islamic religious and cultural heritage that specifies certain rules about life and economic activity. However, Sharia law may have no direct influence on financial and corporate legal frameworks. Abdel–Magid (1981) cited in Kantor et al. (1995) highlights the principles of Islamic economics and argues that:

> "The environment of corporate reporting in Islamic countries will be characterized by political, social and economic forces different from the forces found in the Western business environment. . . . The emergence of an Islamic model of accounting is a real possibility" (P. 97).

Kantor et al. (1995) indicates that accounting information in developing countries is seen as both passive and active. It is passive in that financial reporting practices may be explained by a country's particular history or its stage of development (Mueller, 1967). It is viewed as active in that the choice of financial reporting practices can actively encourage or discourage development (El–Safty, 1989). Thus, accounting information in Egypt may differ from that supplied in developed countries such as the US and UK. France, more than any other of the developed countries, has financial reporting practices that are similar to those of Arab countries (including Egypt) because of the role played by civil law and the past colonial ties. In the last twenty years, the

relatively closer association of Egypt and other Arab countries with the United States may have driven a shift to the American style accounting practices; specific reporting practices that relate to either broad accounting principles such as the use of accruals and conservatism have grown in prominence. Kantor et al. (1995) point out that the financial reporting policies are not significantly different between Arab countries and Western countries. These practices which involve such items such as the disclosure of depreciation amounts and the use of depreciation methods, accounting treatment for inventory, the methods used to account for investments and the disclosure of information on accounting choices are broadly similar.

## 2.6 Conclusion and closing remarks

This chapter has attempted to present the main structural characteristics of the business, financial and economic environment within which Egyptian firms operate. This chapter reviews the Egyptian business environment and outlines the chronology of events associated with the economic reforms that started in Egypt during the 1990s. Moreover, the insights offered by contingency theory and the nature of current accounting practice in Egypt were discussed.

This investigation indicates that until the 1990s, Egypt had a largely managed economy with many publically–funded companies. In 1991, the total number of such companies was 399 entities controlled by twenty–seven holding firms (now reduced to ten); 190 of the companies have since been privatised[29]. Egypt has long–established stock market but this institution remained inactive for 30 years. Following the many privatisations, the ESE has been re–activated in the 1990s but the market is still thought

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[29] This figure is correct as at 30–6–2002.

to be inefficient. In Egypt, investment incentives are a prominent feature of the Egyptian tax policy. Tax incentives can be conveniently grouped into two categories: first, tax holidays are handed out under the recently issued Investment Law No. 8/1997 by GAFI and second, general investment incentives are available to all firms under the general income tax code. There are, in addition, other selective incentives directed towards specific kinds of firms. For example, all joint–stock companies, public or private, listed on the stock exchange, are tax exempt on the equivalent of the CBE deposit rate (currently about 9.25%) on their paid–up capital. Egypt uses tax holidays of between 5 and 20 years to promote certain activities and to encourage new industries. For comprehensive income tax, the corporate tax uses the term of "economic depreciation" of assets evaluated at the cost of replacement (El–Samalouty, 1999); these are instead of depreciation charges in the accounting earning. Thus there is a significant difference between the tax affects of depreciation and inventory accounting policies.

Furthermore, an analysis of ownership and control structure within the corporate sector reveals that the majority of Egyptian firms are primarily owned by relatively small numbers of shareholders or families. That situation suggests that owners will frequently be clearly involved in monitoring company accounting policies. Also by virtue of the law, any person intending to launch an acquisition resulting in an ownership of at least 10% of capital must give the company two weeks notice via registered mail about the change. The ownership required to call shareholders' meetings is 5% for ordinary meetings and 10% for extraordinary meetings. For these reasons, in this study, ownership control is assumed to be an important influence on accounting decisions. In Egypt, bonus contracts are usually based on accounting earnings; so the existence of such schemes is also assumed to exert influence on

managers' choices about accounting policies.

There are strong links between the Egyptian state apparatus and large Egyptian firms. The state has encouraged large firms because of their potentially significant affect on unemployment and economic prosperity. For example, all joint–stock companies can claim a five–year tax holiday if they have 50 employees or more. Larger firms, due to their size, may be successful participants in the political process. This success can be seen by the lower effective tax rates that larger firms are supposed to face. Political benefits and investment allowances may contribute to a reduction in effective tax rates. Thus, this study considers whether firm size can explain accounting choices of Egyptian companies.

Traditionally, large Egyptian firms relied heavily on debt rather than equity as their major source of capital. The financial structure of industrial firms operating in Egypt may influence the accounting choices adopted, as capital providers are relatively few and maintain a close relationship with a firm. Egyptian banks constitute the main source of funds for Egyptian industry. In certain cases they own some of the share capital. A significant portion of equity in many firms is owned by a relatively small number of shareholders or families, and the resulting ownership structure is more concentrated than that in the USA and other Western countries. Consequently, the financial accounting information in Egypt may be more oriented toward the needs of small numbers of big shareholders, financial institutions and the government than toward those of large numbers of small equity investors.

# Chapter 3: Theoretical Framework and Literature Review

## 3.1 Introduction

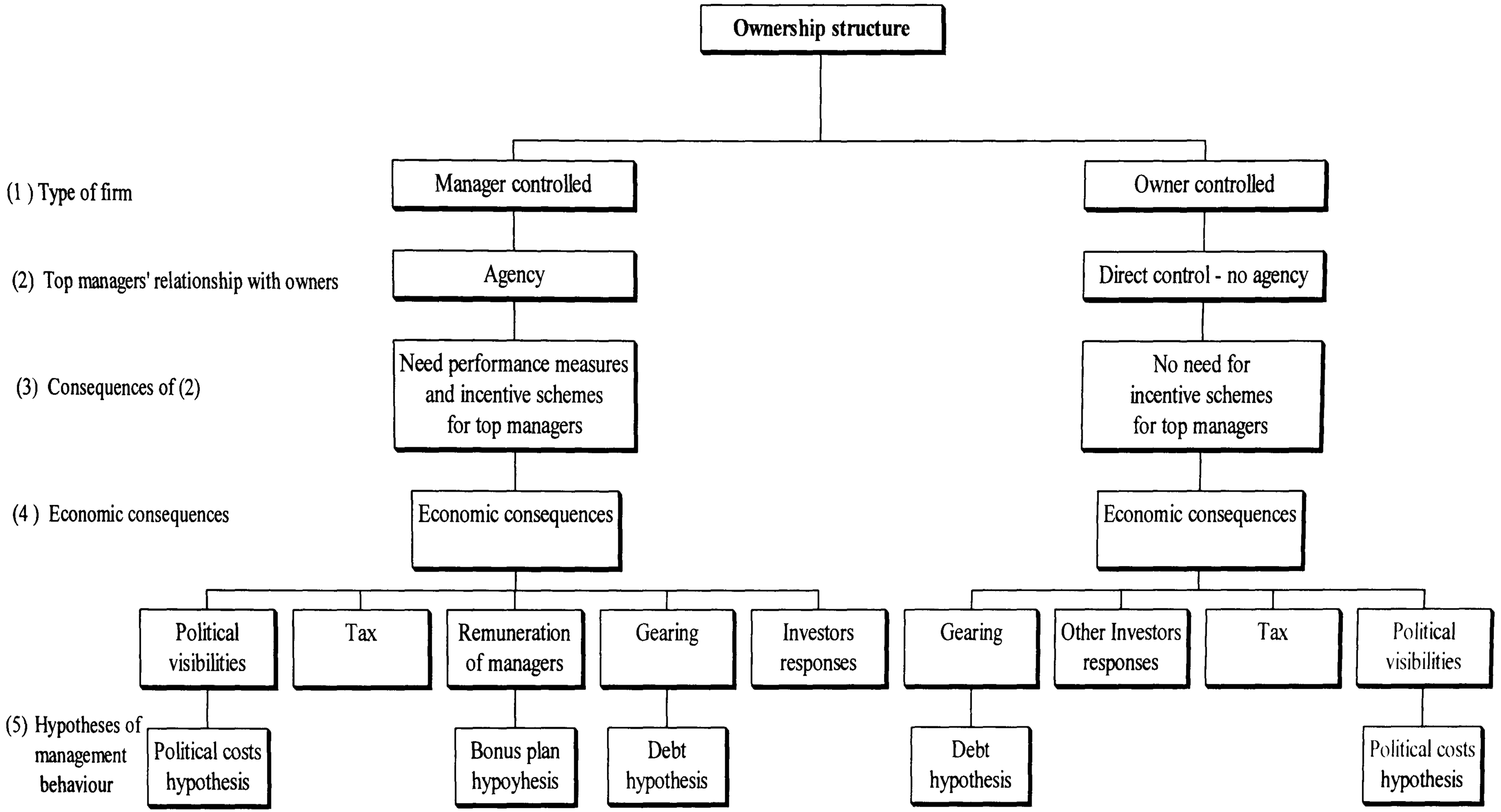
The current study analyses the possible accounting choices of managers when faced with different organisational structures and economic factors. Essentially, it is based upon an assumption that managers' behaviour varies in different contexts; i.e. that their actions are contingent on the situation in which they find themselves (see Chapter 2). One fundamental factor that influences policy decisions is the extent to which managers of businesses are major owners – i.e. whether the firm is "owner–controlled" or "manager– controlled".

Of course, all available bases for categorising firms by reference to the level of owner control are necessarily arbitrary. Clearly, single owners who manage their businesses personally are at one end of the spectrum. At the other end are quoted firms where no shareholder owns a large enough block of shares to single-handedly influence company policy. In between these extremes, equity holders who are not managers may have greatly varying opportunities to influence management policy; (e.g., financial institutions that hold blocks of shares in a quoted firm may have numerous opportunities to informally influence managers whereas small individual shareholders may have little opportunity to effect policy). Nevertheless, one could reason that the usual approach that assumes that the level of a shareholder's influence is associated with the size of his/her shareholding is an acceptable basis for identifying the opportunity to influence a firm's policy. Even here, the criterion based on percentage of capital owned is necessarily arbitrary – many firms may be incorrectly categorised if one is seeking to identify whether owners control their firms in reality. The way in which this issue of definition is dealt with is discussed in more detail in the following sections. (It is, perhaps, important to recognise that incorrect categorisation of firms

will reduce the likelihood of observing differences that exist in the behaviour of owner and manager controlled businesses).

The reasoning behind the structure of this chapter is shown by Figure 3-1. This figure highlights the thinking which underpins the chapter – it is heavily dependent on the perception that agency relationships affect accounting choices. Specifically, the thesis suggests that such choices are likely to be different in manager–controlled firms from those in owner–controlled firms because agency issues vary between the two categories of companies. Subsequent sections of this chapter will follow the structure indicated in Figure 3-1. In particular, the consequences of managers' relationships with their owners are considered for the two types of firms. These consequences are then examined within the extant literature before the PAT hypotheses are developed.

Within this chapter: (a) the proposed theoretical model and the relevant literature are reviewed; and (b) the determinants of accounting choices and the consequences of these choices are introduced. The chapter focuses on three areas of research about influences on managers' accounting choices. Section 3.2 discusses the possible effect of ownership structure on accounting choices and management performance measures using the "agency costs" paradigm (Jensen and Meckling, 1976). Section 3.3 concentrates on the potential economic consequences of managers' relationships with their firms' owners. Section 3.4 reviews the findings of earlier studies about PAT and accounting choices in order to clarify how managers may respond to the economic consequences that might arise. More specifically, section 3.4.1 introduces the economic philosophy underlying PAT while sections 3.4.2, 3.4.3 and 3.4.4 outline three motivations for accounting choices. Finally, a synopsis of the three areas of accounting research is provided and the main research question is established in section 3.5.




**Stated PAT hypotheses**

**Figure 3-1 Proposed theoretical model for the determinants of accounting choices**

## 3.2 Ownership/control status

In an Egyptian context, ownership structure is particularly significant. For example, an Egyptian firm might be owned by: (a) one or more family members; (b) an investor group; (c) holders of equity shares quoted on the ESE; (d) shareholding employees and/or (e) other companies. Managers of companies with widely dispersed share ownership frequently face very little external supervision of their decisions; in this setting conflict may arise between the interests of managers and the goals of shareholders. For firms where one shareholder has a sizeable equity stake, a great deal of control may be exercised over managers. Ownership structure therefore needs to be considered as a potential influence on accounting choices in Egypt.

In the literature, there are two competing arguments about the separation of corporate ownership from control. One suggests that managers when unencumbered by the threat of controlling shareholders will operate the firm in their own interest; such actions may lead to non–profit–maximizing behaviour. Williamson (1963) notes that certain managerial motives can result in "expense preferences" for certain types of items (e.g. staff expenses, payments for emoluments). Proponents of this view suggest that the separation of ownership and management limits the ability of owners to monitor executives; hence managers may be able to achieve a steady growth of earnings with a gradual rise in share prices rather than maximisation of profits. However, the other argument suggests that managers are effectively constrained from taking actions that are not in the best interest of the owners (see Hunt, 1986). A number of researches point out that any sizeable deviation from profit maximization may cause the firm's share price to drop and encourage another company to launch a takeover bid (Jensen and Meckling, 1976; Marris and Mueller, 1980; Hunt, 1986). In order to

examine whether separation of ownership and control affects managerial behaviour, it is helpful to define what is meant by the terms owner–controlled and manager–controlled firms.

The first category is usually intended to include those firms where a group of investors have the ability to control the selection of a majority of the board of directors through the voting rights from their shares in the firm. The second category includes companies with a diffused ownership. The most common method used by researchers to divide samples into the two categories is to separate owner–controlled and manager–controlled firms on the basis of some percentage of the shares which is held by an "owner". Most researchers have defined the owner–controlled group as firms that have at least one shareholder (or related group, such as a family) who owns a certain minimum percentage of the equity (e.g., 10%). Manager–controlled firms are usually defined as all companies that are not included in the owner–controlled category; i.e. that do not have any shareholder owning enough equity to meet the criteria adopted to identify owner–control[30]. For this analysis, ownership control is measured by the average number of shares held per owner. The smaller the ownership control proxy, the more widely–held (manager–controlled) is the firm's equity. In subsequent sections, it is argued that managers' choices of discretionary accounting choices may be influenced by this ownership proxy. In those owner-controlled firms where direct monitoring takes place, the usage of incentive mechanisms such as bonus plans may be minimal. As a

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[30] However, some researchers depart from this conventional criterion where evidence exists for categorizing a firm differently (Stano, 1976; Gadhoum and Zeghal, 2000; Jung and Kwon, 2002). For example, Bauwhede et al. (2003) distinguish between two types of firms: publicly or privately held firms. They used a dichotomous variable to define the type of ownership/control by setting the measure equal to one if a firm is listed on the Brussels stock exchange and zero otherwise. Furthermore, Jung and Kwon (2002) define blockholders as those shareholders who hold more than 5% of the holdings. Mikhail (1999) provided a comprehensive discussion of how ownership concentration tests do not impose a uniform definition of "control" or take into account considerations peculiar to manager-controlled companies or have diffuse ownership.

result, managers may feel no need to select among accounting alternatives in order to increase reported income. In contrast, the owners of such firms may rely on debt financing (i) to share in the monitoring of managers (Jensen and Meckling, 1976) and (ii) prevent the dilution of their equity stake (Ibid). Thus, the managers in owner-controlled firms may make accounting choices to select income-increasing accounting methods in order to placate the owners of debt capital. Finally, managers of owner-controlled firms may be encouraged to choose income decreasing accounting alternatives in order to "minimise" the political visibility of the prominent owner; any evidence of "excessive" profits may reflect badly on the owner and render him/her liable for personal criticism and/or economic penalties.

### 3.2.1 Agency relationships

Agency theory focuses on the idea of contractual relations; the contracts involve a principal and agent in a setting where there is information asymmetry between the two (Jensen and Meckling, 1976)[31]. The principal will attempt to maximize his/her own wealth and contract to avoid conflicts. Under this agency costs perception, one can assume that managers may have incentives make decisions that are in their, but not necessarily in their shareholders', best interests (Capozza and Seguin, 2002). Jensen and Meckling (1976) suggest that shareholders will take actions to mitigate the potential for such costs since these may reduce the value of the firm. Thus, where possible they will seek to "control" the managers.

One could assume that the decisions of managers in manager–controlled firms are

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[31] Jensen and Meckling (1976) highlighted the agency problem that often arose (a) between a firm's shareholders (the principals) and the management (agent) and (b) between shareholders and bondholders in an imperfect capital market.

unlikely to be as tightly constrained by the owners as those in owner–controlled companies, because the ability to monitor the managers may not be as great. Agency theory suggests that the goals of managers and owners may not be aligned and that this misalignment creates the need for costly monitoring through compensation contracts (Jensen and Meckling, 1976). To align the goals of the two parties, compensation contracts may be designed to motivate executives to make decisions that will not only increase their own wealth, but will also increase shareholder wealth[32]. Steps taken to increase shareholder wealth should be reflected in improved firm performance (Watts and Zimmerman, 1990).

Agency theory predicts that contractual parties expect managers to utilize their discretion over accounting decisions to maximise their personal benefit. Further, opportunistic behaviour by managers that is acceptable under the contracts is assumed to be appropriate in reducing agency costs (Fama, 1980; Jensen, 1983). It has been suggested that ownership structure affects the agency conflict between manager and shareholder. McConnell and Servaes (1990) indicate that interests of managers and owners become more closely aligned as the extent to whether owners manage business "managerial ownership" increases which leads to improved firm performance. One can assume that in owner-controlled firms, agency conflicts are less apparent, because owners have both powerful incentives to maximise their own wealth as well as the ability to monitor managers. In manager-controlled firms, the owners may not have the ability to monitor managers directly and may therefore have to rely on compensation schemes, debt holders potential on post actions or the threat of a takeover to encourage

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[32] Using the Forbes executive compensation survey data, Jensen and Murphy (1990) found that CEO wealth derived from cash compensation changes only $3.25 for every $1,000 change in shareholder wealth.

senior managers to maximise shareholders wealth[33].

Management compensation contracts may be designed to reduce internal agency conflicts between the managers of a firm and its owners or shareholders. The literature suggests that managers exploit their accounting discretion to take advantage of the incentives provided by bonus plans. However, the literature does not provide evidence on whether this discretion comes at the expense of shareholders, or whether it is part of a deliberate attempt to align managers' incentives with those of shareholders, possibly at the expense of other claim holders (Field et al., 2001)[34]. Accounting researchers have renewed efforts to discover the determinants of accounting choices in a response to calls for the development of a positive theory of accounting (e.g., Watts and Zimmerman 1978; 1986). The resulting literature is in large part based on the testable implications of agency theory as articulated by Jensen and Meckling (1976)[35].

Consequently, one can argue that in manager–controlled firms there is a greater need for incentive schemes than in their owner–controlled counterparts. Moreover, management performance measures in manager–controlled firms may be different from those employed in owner–controlled companies. In the manager–controlled firms, accounting reports tend to be a major source of news about firms for shareholders; the latter may not seek out additional news as investors' information processing costs are large relative to the possible gains that they can achieve. Thus, investors and

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[33] Of course, for a takeover to be a credible threat, a well-functioning and efficient capital market is necessary (Jensen, 1986). However, the evidence from Chapter 2 suggests that the ESE may not operate in such a manner.

[34] Thus, because individuals may act in a self–interested manner, considerable attention needs to be given to contract design *ex ante* in order to mitigate many of the problems associated with incentive alignment *ex post* (Emanuel et al., 2003).

[35] Mayers and Smith (1988; 1992) hypothesize that the coexistence of multiple forms of ownership structure is partly attributable to the relative efficiency of ownership structures in controlling agency costs.

shareholders may respond to the reported accounting numbers *per se* since they do not have the capacity to seek out alternative sources of information. Consequently, one can reason that in manager–controlled firms performance measures may be based on traditional ratios such as net income to net worth, sales to total assets, net income to total assets, net income to sales and long–term debt to total capital. In contrast, the owners of owner–controlled firms usually have direct access to information over and above that contained in financial reports and therefore may be able to monitor managers more easily without formal measurers. Thus, (i) financial performance measures may not be needed to monitor managers directly and (ii) if performance measures are necessary alternative non–financial data may be employed.

A sizeable literature has developed about the relationship between type of control and accounting choices. It is hypothesized that companies with widely–held equity are more likely to exercise both income–increasing and income–decreasing discretionary accounting choices in an attempt to smooth earnings[36]. For example, Smith (1976) empirically tested the hypothesis that manager–controlled firms are more likely to smooth income[37] relative to their owner–controlled counterparts. Smith defined a firm as owner–controlled if one party owned 10% or more of the voting shares and manager–controlled if no single block of equity greater than 5% was controlled by any

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[36] However, Fama (1980) argued that there must be no difference between the behaviour of owner-controlled and management-controlled firms, since competition in the labour market will perceive the latter.

[37] The income–smoothing hypothesis predicts that managers will use their discretion over accounting policy to reduce the magnitude of the deviation of reported earnings from an earnings trend number. The income–smoothing hypothesis suggests that managers are more likely to increase income when earnings are abnormally low in an effort to minimize fluctuations in the income stream. The objective of income smoothing is assumed to be to change financial statement users' perceptions regarding the risk of the firm.

one party[38]. Using a sample of 110 firms (57 manager controlled and 53 owner controlled) between 1954-1962, Smith examined five different target earnings per–share figures (as potential objects of smoothing)[39] and various accounting policy decisions as smoothing "tools" in this analysis. The results suggested that both owner–controlled and manager–controlled firms make accounting policy decisions that smooth income but that manager–controlled firms are more likely to smooth income and to do it more often than their owner–controlled counterparts. This result supported Smith's hypothesis that the accounting policy decisions made by manager controlled firms smoothed income significantly more often than the policy decisions made by owner–controlled companies (p. 721).

In a follow–up study, Kamin and Ronen (1978) hypothesized that manager–controlled firms are more likely to be engaged in smoothing as a manifestation of managerial discretion. They found that manager–controlled firms which operated barriers to entry appeared to smooth income to a much greater extent than their counterparts in industries with low barriers to entry; thus, barriers to entry appeared to

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[38] Range from 5% to 10% was considered as the "grey area" of ownership that neither created "sufficient incentive" for shareholders to engage in monitoring or to act as a valid indicator that owners were active in the management of their firms.

[39] The smoothing objects are the numbers whose series are presumed to be the target of the smoothing attempts. Imhoff (1981) indicates that the target of management's smoothing efforts may vary across firms. He also points out that smoothing may take place over a long time span; thus, the length of the period studied may influence the results of the any investigation. Imhoff (1981) points out that one of the more popular methods of investigating smoothing behaviour is selecting certain key variables (e.g. extraordinary items), which are influenced through management actions, and to observe their effect on earnings. However, Zmijewski and Hagerman (1981) argue that companies do not necessarily select accounting procedures independently, but consider the overall effect of all accounting procedures on income. The association between type of ownership/control and income smoothing behaviour has been examined in Ma (1988). He investigated the influence of the degree of control on smoothing behaviour and provided some indication that management–controlled firms have relatively smoother income series than their owner–controlled counterparts. Similarly, Carlson and Bathala (1997) identified many variables which influence smoothing: manager versus owner control status, debt financing, institutional ownership, the dispersion of equity ownership, profitability and firm size. Using Albrecht and Richardson's (1990) methodology, their results suggest that ownership structure, executive's incentive structure and firm profitability are important in explaining income smoothing.

have an effect on the extent of any income smoothing. However, Moses (1987) found no evidence to support the income–smoothing hypothesis. Using the PAT arguments developed by Watts and Zimmerman, Dhaliwal et al. (1982) tested for a relationship between depreciation method and ownership structure. Specifically, Dhaliwal et al. predicted that manager–controlled firms were more likely than owner–controlled companies to choose accounting methods that increased reported earnings. Dhaliwal et al. found that, as hypothesized, manager–controlled firms were more likely than owner–controlled firms to use the straight–line depreciation (SLD) method for financial reporting purposes. They argued that the managers of management-controlled firms preferred accounting methods which resulted in high and/or early reported income in order to keep shareholders satisfied and/or increase their remuneration.

In a follow–up study, Abdel–Khalik (1985) analysed the effect of LIFO adoptions on executive compensation where "type of control" was included as an intervening variable to test for its potential effect on the choice of inventory method. Abdel–Khalik employed a single 10% ownership cut off for categorizing firms as either owner–controlled or manager–controlled. The results indicated that there was no significant negative association between executives' income–based bonus plans and adopting LIFO. However, the study suggested that manager–controlled firms which adopted the FIFO inventory method achieved a relatively higher level of compensation based on reported earnings than firms which adopted LIFO; thus, they uncovered a positive association between the existence of bonus plans and the adoption of income increasing inventory methods.

Penno and Simon (1986) compared the accounting-policy decisions of private and public firms. They indicated that public firms are more likely to be manager-controlled than their private firm counterparts. Penno and Simon tested the hypothesis

that the publicly–traded firms are more likely to select accounting methods which will increase the level of reported earnings[40]. On the other hand, privately–owned companies are more concerned with reducing a firm's tax burden. They argued that, managers of publicly-traded firms are more likely to adopt income-increasing accounting methods due to the likely impact of reported income on security prices (Ball and Brown, 1968). Moreover, publicly–traded firms are more likely to be manager-controlled and thus employ bonus schemes based on reported profits. Privately–held firms may not have the same incentives to choose income-increasing accounting policies. Consequently, privately–held firms may not have the same incentive to employ accounting policies which have real economic costs such as the use of FIFO when accounting for inventory using LIFO would reduce tax liabilities.

Niehaus (1989) found evidence to support the hypothesis that there is an association between a firm's ownership structure and its accounting-method choices. He argued that owners' wealth is mainly a function of equity concentration since firms with concentrated outside ownership can effectively monitor and control mangers' actions; he pointed out that the choice of LIFO initially decreased as managerial ownership increased. Thus, firms with concentrated-ownership are expected to adopt accounting methods which result in a reduction of tax payments. His empirical findings supported this view. On the other hand, no significant relationship was found between a firm's ownership structure and depreciation method or investment tax credit method. Niehaus's findings about the relationship between ownership structure and depreciation method contradict the findings reported by Dhaliwal et al. (1982).

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[40] They used survey data to conclude that publicly–traded firms are more likely to use income-increasing accounting methods for inventory, investment tax credits, and depreciation than are private firms.

Dempsey et al. (1993) classified ownership structure into three groups: owner–managed, externally–controlled and manager–controlled. They uncovered significant levels of earnings management[41] through variations in the level of extraordinary items when management and ownership were separated; this result is consistent with the predictions of agency theory[42]. More recently, Carlson and Bathala (1997) empirically tested the association between differences in ownership structure and accounting choices. Several explanatory variables were identified: manager versus owner control, debt financing, institutional ownership, dispersion of share ownership, profitability and

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[41] Schipper (1989) defined earnings management (EM) as purposeful intervention in the external financial reporting process, with a view to obtaining private gain for shareholders or managers. Earnings management may take the form of either income increasing or income decreasing accounting choices. Opportunities for such earnings management arise because of flexibility permitted by GAAP (Evans and Sridhar, 1996). Many incentives and opportunities for earnings management have been put forward in the literature. First the literature suggests that managers may have personal incentives for management earnings because the consequences of their actions may be beneficial for them (see Healy, 1985; Gaver et al., 1995; Guidry et al., 1999; Holthausen et al., 1995). Second, PAT proposes that earnings management may help the firm to comply with debt covenant clauses (see Sweeney, 1994; Defond and Jiambalvo, 1994). The accounting choices literature puts forward a third motivation for earnings management. DeAngelo et al. (1994) detected that accounting choices were used by companies experiencing persistent problems with their level of profit in order to cover–up poor performance. Moreover, minimization of political costs may encourage firms to manage earnings (see Eilifsen et al., 1999; Han and Wang, 1998). As mentioned earlier, Han and Wang (1998) provide evidence that oil companies during the Gulf War used income decreasing accounting policies to avoid the political consequences of reporting higher profits. Ownership structure and type of control would motivate for EM. For example, Dempsey et al. (1993) found significant levels of EM when managers were not the owners of the company. Fields et al. (2001) argued that earnings management might also be beneficial; it could convey inside information about future cash flows and possible uncertainty to investors enabling them to avoid undervaluation due to information asymmetry. However, previous studies in this area tend to pay more attention to the potentially negative consequences associated with earnings management (such as misleading investors) rather than to any positive aspects of this activity. Some motivation for EM is not explicitly linked to PAT. For example, Hall and Stammerjohan (1997) find that firms with high debt levels, pending legal damage rewards and foreign competition are more likely to manage earnings. Further, firms that were not previously quoted on the market increased their income just before going public (see Friedlan, 1994).

[42] There is an argument that, if managerial theories are correct, different relationships will exist between investment decisions and the time series profile of reported earnings for owners–controlled and managers–controlled firms (Sunder, 1980). Sunder predicted that managers–controlled firms would select projects that yielded a smoother profile of earnings than owners–controlled firms. Sunder also examined the short–term negative effect of investment on earnings using the data and samples of firms contained in Palmer (1973) and Stano (1976). He suggested that since it was possible to identify directly firm–specific accounting methods, it might be desirable to separate the effect of accounting choices from the effect of type of control on the investment–earnings relationship.

firm size. They concluded that ownership structure, executives' incentive structure and firm profitability were important factors in explaining income smoothing.

To summarise, the evidence thus far suggests that there is a relationship between ownership/control and at least some accounting choices. For example, Hunt (1985)[43] Penno and Simon (1986) and Niehaus (1989) found that lower levels of management ownership are associated with the decision to adopt the LIFO inventory method. Also, Salamon and Smith (1979)[44] Dhaliwal et al. (1982) as well as Carlson and Bathala (1997) presented evidence that when compared with similar owner–controlled companies, manager–controlled firms often make accounting choices that increase reported earnings. However, there have been some inconsistent results. For example, Abdel–Khalik (1985) found no association between the choice of an inventory method and ownership structure[45]. Further, Niehaus (1989) documented no correlation between

[43] Hunt (1985) identified ownership-structure and the firms' ability to avoid debt-covenants violation as explanatory variables influencing firms' inventory-method choice. More specifically, Hunt hypothesised that (a) owner-managers' wealth is more associated with share value and they are more likely to switch to the LIFO; (b) firms that have employed LIFO are less likely to use accounting-based bonus plans and (c) the closer a firm was to violating debt-covenants, the less likely it was to adopt the LIFO method. The results emerged from univariate and multivariate tests were consistent with the hypothesis that the closer a firm is to violating the lending-related constraints, the less likely it is to adopt the LIFO method. On the other hand, no relationship appeared between the inventory-method choice and the existence of income-based bonus plans, but there was evidence that firms that adopted the LIFO method had significantly lower levels of managerial ownership.

[44] Using a sample of 64 firms (32 manager-controlled and 32 owner-controlled) between 1954-1962. Salamon and Smith (1979) argued that executives of manager-controlled firms are more likely to influence the level of reported profits during years with below-average stock returns, than during years with above average stock returns. The findings indicated that there was a significant association between the security-return performance and the timing of the reporting policy choice for the manager-controlled firms, whereas, the association was not significant for the owner-controlled firms.

[45] Abdel-Khalik argued that ownership variable could influence inventory choice since the executives in owner-controlled firms derive more personal wealth from increases in the value of their stock holdings than would come about from the switch to LIFO. Abdel-Khalik documented that owner-controlled firms are likely to adopt the LIFO, due to the tax benefits that result from such a choice. However, the results did not indicate that for firms that switched from FIFO to LIFO, there was any difference between the management and owner-controlled firms, with regard to the structure of payment to executives. He also indicated that in the management-controlled firms which kept the FIFO method had a higher accounting-based schemes, compared with the other firms.

the choice of the SLD method and ownership structure. Hunt (1986) argued that these inconsistencies might be the result of methodological differences, variations in sample size or differences in time period examined. Despite these inconsistencies, one can argue that the balance of the evidence supports the notion that accounting choices and ownership structure are correlated. Generally, these studies use a binary dependent variable representing the choice of accounting method and non–binary explanatory variables representing firm specific characteristics. The dependent variables previously examined include the choices between accelerated versus SLD methods as well as FIFO versus LIFO inventory valuation methods. Selected empirical studies of ownership/control hypothesis presented in chronological order are summarised in Table 3-1.

**Table 3-1 Selected empirical studies of ownership/control hypothesis**

| Author (s) | Motivations | Sample | Comments | Results |
|---|---|---|---|---|
| Kamin and Ronen (1978) | Test the influence of the separation of ownership and control on accrual smoothing. | 310 out of Fortune's 500 largest U.S. industrial firms in 1965. | Manager-controlled and owner-controlled classified as (i) Strong owner controlled (one party held at least 30%); (ii) Weak owner controlled (one party held 10% – 29.9%); (iii) Management controlled (no single party held 10% or more). | They found that for the high barrier to entry (BTE) group, manager-controlled firms appear to smooth income to a higher degree than owner-controlled firms, and the opposite results were obtained for the low BTE group. |
| Dhaliwal et al. (1982) | Effect of ownership structure on some accounting choices, (SL vs. accelerated depreciation method). | Using the sample employed by Salamon and Smith (1979). | Direct test of the use of certain accounting methods, SLD vs. accelerated method for a sample of owner-controlled and manager-controlled firms. | As hypothesized, manager-controlled firms are more likely than owner-controlled firms to use SLD. Also, found support for the size hypothesis at the 0.15 significant level. |
| Amihud et al. (1983) | Test the differences between owner–controlled and manager–controlled firms with respect to their risk. | 56 U.S. firms between 1957–1971. | Method used in Kamin and Ronen (1978). | Manager–controlled firms are more likely to exercise income smoothing than owner–controlled firms. |
| Abdel–Khalik (1985) | Test the effect of executive compensation on some accounting choices included an independent variable for control type (OC vs. MC). | | Direct test of the use of certain accounting methods, e.g. LIFO vs. FIFO. | No correlation between inventory method and ownership structure. |
| Dempsey et al. (1993) | Test the effect of ownership structure on earning management | 248 U.S. firms between 1960–1966 with at least one extraordinary item. | Classification into extraordinary items and ownership structure: 1- owner managed, 2-externally controlled, 3-management controlled. | Significant levels of earning management through extraordinary items when management and ownership are separated. |
| Carlson and Bathala (1997) | Test association between differences in ownership structure and accounting choice. | 265 U.S. firms between 1982–1988. | Albrecht and Richardson (1990) methodology. Logistic regression model. | Differences in the ownership structure, executive's incentive structure and firm profitability appear to establish some accounting choices. |

## 3.3 The economic consequences of accounting choices

Economic consequences[46] and accounting policies are generally associated through causal links. For example, accounting policies can affect a company's cash flows and their distribution among a firm's stakeholders: e.g. shareholders, managers and bondholders (see Holthausen and Leftwich, 1983; Taylor and Turley, 1986; Tzovas, 1998)[47]. Assuming that each individual aims to maximize his/her utility and prefers a higher to a lower cash flow surplus[48] (Grinyer, 1986), then, if a particular accounting method can increase, or decrease, different stakeholders wealth, these parties have an apparent motive for preferring certain accounting methods (Watts and Zimmerman, 1978; 1986). Hindley (1970) suggests that managers have incentives to make accounting choices and report accounting income in the most positive way in order to obscure poor managerial performance and keep shareholders satisfied; these incentives depend on the ownership structure of the firm. Therefore, a firm's ownership

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[46] The economic consequences of different accounting choices were initially analysed by Watts and Zimmerman, (1978, 1986) and later extended by Hagerman and Zmijewski (1979), Press and Weintrop (1990) and Sweeney (1994). All these authors explain the link between a firm's cash flows and reported accounting income numbers via positive theories but Holthausen and Leftwich (1983) describe them using an economic consequences framework. Accounting choices have economic consequences if changes in the methods used to calculate accounting numbers affect the distribution of firms' cash flows or the wealth of parties who use those numbers for contracting and/or decision making purposes. Contracting and monitoring costs (such as management compensation contracts, lending agreements and firms' political visibility) are expected to extend the economic consequences that may arise (Holthausen and Leftwich, 1983).

[47] For example, it has been suggested that enterprises facing high contracting costs are likely to focus on accounting choices because accounting numbers are used in those contracts (see Watts and Zimmerman, 1986). If current existing contracts are more efficient in reducing agency costs than other unused agreements, the procedures employed to calculate accounting numbers in those contracts might be more efficient than alternative approaches. Using alternative procedures may increase agency costs and reduce firm value or manager compensation.

[48] Jensen and Meckling (1976) argued that the firm value depends on the fraction of shares owned by the management. They divide stockholders into two groups, inside shareholders - who manage the firm - and outside shareholders. The inside shareholders, however, are able to increase their cash flows by additionally non-marketable perquisites. In this framework, there is an incentive for the manager to adopt investment and financing policies that benefit him, but cost the outside stockholders.

structure can influence the accounting method chosen. Such logic provides an explanation for managers' choice of accounting procedures.

In the theoretical model (see figure 3-1), the accounting choices of owner–controlled firms may differ from those of manager–controlled counterparts because of differing agency relationships which may reflect: (a) different bases for the remuneration of the dominant managers; (b) more concern for cash flow implications (e.g. taxation) of accounting alternatives; (c) less emphasis placed on the perceptions of external parties regarding management's efficiency and ability and (d) possibly different more personal relationship with bankers[49]. When managers' wealth is strongly dependent on the value of their equity holdings they might prefer logically income decreasing accounting methods which might be expected to reduce the tax paid by the firm. On the other hand, if managers' compensation is strongly dependent on accounting-based bonus payments, one might expect that income increasing accounting methods will be preferred. Owner-manager's wealth is more likely to depend on the value of their share-holdings, while the remuneration of a manager of management-controlled firms is more likely to depend on accounting-based bonus schemes[50]. In owner-controlled firms, the extensive involvement of a firm's owners in the administration of the company permits a close monitoring of top managers' conduct

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[49] Crutchley and Hansen (1989) investigated whether insider holdings lead to lower agency costs by examining the relationship between leverage, dividend policy and insider holdings. The authors found that higher earnings volatility is positively related to higher insider holdings, larger dividends and lower debt. On the other hand, if managers face lower costs of diversification, it leads to higher insider holdings, lower dividends, and lower debt. They argued that managers control agency costs through financial policy trade-offs.

[50] However, earlier empirical research reported findings indicated that the use of accounting-based bonus plans does not necessarily imply that managers will prefer income-increasing accounting methods (see Demsetz and Lehn, 1985).

and owners can directly motivates managers' performance[51]. Therefore, the need for bonus plans for top managers is possibly less important[52]. It might be expected that, because of the more extensive use of accounting-based bonus plans in such firms, managers of management–controlled firms may adopt accounting choice policies that increase reported income[53]. On the other hand, managers of owner-controlled firms are not expected to face similar incentives. Thus, they can get more aggressively involved in tax–planning[54]. In closely–held firms, executives can directly communicate to shareholders; owners usually have more direct access to detailed economic information about the business and therefore may be able to monitor managers more easily without formal measurers for performance[55] (Klassen, 1997). On the other hand, in firms with

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[51] Fama and Jensen (1983) pointed out that when a manager only owns a smaller stake, he is disciplined toward firm value maximization by the market forces such as the managerial labor market.

[52] Evidence from earlier studies (e.g., Amihud et al., 1983; Dempsey et al., 1993; Short, 1994) suggests that there is a link between managerial compensation schemes and ownership/control structure; i.e. that management–controlled firms are more likely than owner–controlled firms to have incentive compensation plans.

[53] However, bonus plans are not entirely based on reported earnings. Executives' remuneration may be linked with a firm's stock price or by offering stock-options to executives (Hall, 2002).

[54] Grinyer (1986) argues that high cash flows provide managers with opportunities to directly increase their wealth and well-being - e.g. increased salaries, perquisites etc. - and their job security by reducing the possibility that the firm will not meet various financial constraints, hence, managers prefer higher to lower cash-flows anyway. Thus one can be argued that managers will opt the tax planning since by doing so they increase the available cash-flows.

[55] Boudreaux (1973) hypothesised that owner–controlled firms are not only expected to earn higher rates of return than manager–controlled companies but that the two types of firms should also differ in terms of risk. Boudreaux tested a model that included return on equity as the dependent variable and control type, industry membership, risk (standard deviation of return on equity) and size as independent variables. The results indicated that rates of return were higher and more volatile for owner–controlled firms than for their manager–controlled counterparts. Stano (1976) incorporated the firm's share return (dividends and capital appreciation) as the measure of firm performance. The results indicated that, when compared to manager–controlled firms, owner–controlled companies had higher growth rates of earnings per share, were more risk averse, engaged in less merger activity and were smaller. Moreover, the annual equity return for the owner–controlled firms was higher than those for the manager–controlled firms. However, in a later study, Demsetz and Lehn (1985) documented no significant relationship between ownership structure and corporate profitability. Demsetz and Lehn's (1985) reported the agency logic and its principal prediction as follows: "If diffuseness in control allows managers to serve their needs rather than tend to the profits of owners, then more concentrated ownership by establishing a stronger link between managerial behaviour and owner interests ought to yield higher profit rates" (p. 1174). Demsetz and Lehn's (1985) findings contradict the agency arguments in Jensen and Meckling (1976)

diffuse ownership, shareholders are likely to rely more heavily on formal controls which are written in terms of accounting numbers to constrain management's activities: thus, the reported accounting numbers *per se* are likely to be one of the main devices available for signalling information to shareholders regarding firms' value and management's ability (Cloyd et al., 1996). Therefore, managers of firms with diffuse ownership may prefer higher to lower reported earnings.

Bankers and other providers of funds may frequently use financial statements for their credit decisions. Under these circumstances, executives of owner-controlled firms may possibly be prepared to forego tax benefits, in order to achieve higher reported earnings (Cloyd et al., 1996)[56]. While the conditions of the debt covenants are often expressed in terms of accounting figures, the accounting methods employed can partially determine whether or not a firm is able to meet the debt covenants (Watts and Zimmerman, 1986; Holthausen and liftwich, 1983; Duke and Hunt, 1990; Press and Weintrop, 1990; DeFond and Jiambalvo, 1994; Sweeney, 1994). Consequently, to avoid debt covenant violations, even executives of closely–held firms may have an incentive to choose a reporting method which yields higher rather than lower reported earnings. The effects on debt covenants may diminish the potential tax savings from LIFO (Cushing and LeClere, 1992). Therefore, managers may balance the benefits of avoiding debt violation against the costs of choosing a tax reducing method (Smith.

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Morck, et al. (1988) and McConnell and Servaes (1990). For example, Morck et al. (1988) indicated that: "Theoretical arguments alone cannot unambiguously predict the relationship between management ownership and market valuation of the firm's assets. While the convergence-of-interest hypothesis suggests a uniformly positive relationship, the entrenchment hypothesis suggests that market valuation can be adversely affected for some range of high ownership stakes".

[56] As Cloyd et al. (1996) state, "Lower current-period reported income can increase the probability of debt covenant violations; it can reduce manager compensation tied to reported income; it may lead to lower performance evaluations...; and it may even be perceived as lowering the market value of the firm. As these costs increase, conformity should decrease" (p. 28).

1993), assuming that, executives are unlikely to forgo tax savings without convincing reasons[57].

PAT is based on the premise that managers' accounting choices have economic consequences because contracts designed to alleviate various agency conflicts within firms are often written in terms of accounting numbers and because contracting and monitoring are costly (e.g., see Holthausen and Leftwich, 1983). Thus, firms' accounting choices are material because they affect incentives and lead to the resolution of agency conflicts[58]. Managerial intent is concerned with accounting choices; specifically, whether the incentive of the decision is to affect the output of the accounting system or whether the incentive derives from other motives (Field, 2001). Thus, one can argue that accounting choices may be affected by whether the company is owner–controlled or manager–controlled. Consequently, agency differences between owner–controlled and manager–controlled firms must be of interest to the extent that they affect the validity of the PAT hypotheses (which could differ between the groups)[59]. The next section of this chapter will discuss the PAT hypotheses; it will focus on the implications of PAT for accounting choices. In addition, the findings from earlier studies are reviewed and summarised. The perception that ownership/control status affects the validity of the PAT hypotheses will be discussed in the next chapter where the hypotheses that are tested in the current study will be established.

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[57] McConnell and Servaes (1995) suggested that debt policy and equity ownership differ across high-growth and low-growth firms. The value of low-growth firms is positively correlated with leverage, and the distribution of equity across insider holdings, institutional holdings, and blockholdings across low-growth firms is more significant than for high-growth firms.

[58] The findings of earlier studies documented that bonus plans schemes may align the interest between owners and managers (Hunt, 1986).

[59] Mikhail (1999) cited literature that found financial reporting incentives vary with ownership concentration (e.g., Dhaliwal et al. 1982, Klassen 1997). Like Mikhail, this researcher believes that the manager-controlled versus owner-controlled comparison can provide a stronger test of the effect of ownership type and PAT hypotheses.

## 3.4 PAT and the accounting choice literature

### 3.4.1 The economic philosophy reflected in PAT

The interest shown by accounting research in examining the economic factors underlying the accounting decisions made by firms is not a new phenomenon. As early as 1964, Gordon considered this issue. More recently, Watts and Zimmerman (1978) used developments in the areas of finance and economics to explain some of the puzzles facing accounting researchers and practitioners. The influential work of Jensen and Meckling (1976) in the corporate finance literature was the impetus for Watts and Zimmerman's analysis. Some of this research draws on theories of agency and economic regulation to develop a series of hypotheses that are capable of explaining the accounting decisions of executives; these hypotheses are in line with the PAT approach initiated by Watts and Zimmerman (1978). The hypotheses suggest that in order to avoid violating debt covenants and to increase their own remuneration, when it is associated with company performance, managers will prefer income–increasing accounting methods. When the goal is to reduce the firm's visible wealth, and thus the threat of political costs, they will choose income–decreasing methods.

PAT attempts to understand why accounting policies matter and to predict which particular accounting policies a firm will choose[60]. It also seeks to explain the reaction of investors to accounting data by establishing a relationship between accounting phenomena and market processes. Efficient contracting versions of PAT imply that firms choose accounting policies to minimize contracting costs. The theory is based on

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[60] Unlike normative theories of accounting, it does not set out to state what accounting procedures and policies should be employed, but rather to explain why they are used and what they are used for (see oxford business dictionary).

a view of the firm as a "nexus of contracts", where the business entity can be described by the various contracts that it enters into; the role of accounting in such contracts may potentially explain why managers prefer certain accounting policies and oppose others (Watts and Zimmerman, 1978; 1986). PAT is a theory that attempts to explain the nature of accounting, the role and activities of accountants and the importance of accountancy to the economy. It seeks to explain observed practice; for example, it aims to explain why certain firms use the FIFO rather than the LIFO inventory method. It also seeks to predict accounting phenomena; for example, to forecast the attributes of firms which adopt FIFO rather than LIFO. PAT thus provides decision makers with explanations and predictions of the consequences of their decisions.

Since Watts and Zimmerman's (1978) pioneering work, research in this subject has been characterized by incremental improvements in empirical research design. A large body of literature in accounting has tested the predictions of PAT. Many of the tests entailed the use of capital market data. For example, tests of the economic consequences of accounting information examine share price reactions to new accounting standards and study whether cross–sectional variations in these price reactions are related to financial variables (see Kothari, 2001). PAT hypothesizes that company specific characteristics such as firm size, leverage and the existence of a bonus plan motivate managers to use accounting choices to increase or decrease earnings. Managers may choose accounting methods in a self–interested attempt to increase the share price of the company for which they work prior to the sale of any stock options that they hold. On the other hand, the same accounting choices may be motivated by managers' objective assessment that the current share price is undervalued according to their private information. Watts and Zimmerman's political

cost hypothesis extends the economics literature on accounting choices to encompass political as well as market processes.

From the literature, one can identify at least three categories of motivations for accounting choices: (a) contracting (b) asset pricing and capital market factors and (c) the influence of external parties. This classification is consistent with the typology of Watts and Zimmerman (1986) and Field et al. (2001).

### 3.4.2 Contracting

PAT usually hypothesizes that mangers use their accounting choices to maximize their bonuses (the bonus plan hypothesis) and to avoid undesirable constraints associated with borrowing (the debt covenant hypothesis). Thus, it concentrates on accounting choices that can affect the outcomes of one or more of the firm's contractual arrangements (Watts and Zimmerman, 1986). Such contractual arrangements include executive compensation agreements and debt covenants; the basic functions of the contracts are to mitigate agency costs by better aligning the incentives of the two parties. However, depending on the structure of these contracts, accounting choices may be made to increase compensation or to avoid covenant violation thereby potentially circumventing the covenants. In most situations, multiple accounting choices can be chosen singularly or jointly to accomplish one or more goals. For example, FIFO for inventory and SLD accounting may often be expected to increase reported earnings and, hence, earnings–based contracts. Alternatively, LIFO often reduces the present value of taxes and the LIFO conformity rule frequently requires that if LIFO is used for tax calculations then it must be also used for financial reporting purposes (Fields et al., 2001). Thus, there are potential conflicts among different goals when choosing between accounting methods.

PAT (Watts and Zimmerman, 1978; 1986; 1990) provided the motivation for many subsequent studies of whether typical contracts supply managers with incentives to choose among accounting methods in order to achieve their desired financial reporting objectives. In general, researchers conclude that such incentives seem to motivate managers to select accounting methods to increase their compensation and to reduce the likelihood of bond covenant violations (Hagerman and Zmijewski, 1979; Zmijewski and Hagerman, 1981; Press and Weintrop, 1990; Gopalakrishnan, 1994; Sweeney, 1994; DeAngelo et al., 1994). So it can be argued that the first category of motivations for accounting choices is the agent contract (contractual motivation) which can be divided to management compensation contracts (internal agency conflicts) and debt contracts (external agency conflicts). Each of these elements are discussed in the next two sub–sections.

### *3.4.2.1 Management compensation contracts*

The usual hypothesis is that managers with compensation schemes directly tied to accounting earnings are more likely to choose income–increasing accounting methods. This suggests that managers select accounting methods in order to affect wealth transfers from the firm's owners and shareholders. Because the existence of earnings–based bonus plans serve as the proxy for earning based management compensation schemes in earlier studies, this hypothesis is known as the "bonus plans hypothesis":

> "Managers of firms with bonus plans are more likely to choose accounting procedures that shift reported earnings from future periods to the current period" (Watts and Zimmerman, 1986, p.208).

Tests of the bonus plans hypothesis have provided mixed results. For example, Hagerman and Zmijewski (1979) found a positive association between the existence of a bonus plan and the choice of depreciation method as well as the amortization period

for past pension costs. However, they found no association with either the choice of investment tax credit or the inventory valuation method employed. El–Gazzar et al. (1986) found an association between the existence of a bonus plan and the accounting methods chosen to report for leasing contracts. However, Bowen et al. (1981) found no association between the existence of a bonus plan and the choice of method adopted when accounting for interest. Ball and Foster (1982) attributed the mixed results of the bonus plans hypothesis to the way in which the bonus plan variable is modelled. They observed that because of its simplistic formulation, the dichotomous specification of the variable is subject to severe construct validity problems. They conclude that the inconsistent findings of prior studies may result from ignoring important bonus plan details (p. 184). Watts and Zimmerman (1978) argued that where a manager's utility is affected by the firm's share price and managerial compensation, managers may adopt accounting choices for the purpose of maximizing their own utility; this possibility was formalised as the "opportunistic behaviour" of accounting policy choice[61] (see Healy, 1985; Holthausen, 1990; Holthausen et al., 1995). The majority of empirical studies interpret their results as supplying evidence that managers take advantage of the discretion provided by compensation contracts to increase their compensation by managing reported earnings (Fields et al., 2001). Selected empirical studies of the bonus plan hypothesis are presented in chronological order in Table 3-2.

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[61] However, Emanuel et al. (2003) indicate that efficient contracting theory can be used to explain details in institutional structures including compensation arrangements, covenants in loan agreements and accounting methods in contracting contexts. Efficient contracting and opportunism are distinguishable theoretically but difficult to distinguish empirically.

**Table 3-2 Selected empirical studies of bonus plans hypothesis**

| Author (s) | Motivation | Sample | Methodology | Results |
|---|---|---|---|---|
| Healy (1985) | Effects of management bonus plans on accruals and accounting choices. | Data for the period 1930–1980. Population is 250 largest US firms from Fortune. Sample is 94 firms for 239 firm years. | Used total accruals as a proxy for discretionary accruals. | Managers are more likely to choose income–decreasing accruals when their bonus plans upper or lower bounds are binding and income–increasing accruals when these bounds are not binding. |
| Clinch and Magliolo (1993) | Whether accounting in the absence of cash flow effects, impacts CEO compensation. | Bank holding companies | Three components of earnings: operating earnings and discretionary non–operating earnings with and without cash flow implications. | No evidence that income from discretionary transactions unaccompanied by cash flows affects compensation. Also, no distinction between the positive association with compensation of operating income and discretionary items with cash flow effects. |
| Gaver, et al. (1995) | Examine the relationship between discretionary accruals and bonus plans bounds. | 102 firms, between 1980 and 1990. | Replication of Healy's study using Jones' (1991) model. | Find support consistent with Healy hypothesis only at the upper bound. Managers increase the profit when too low and decrease it when too high. |
| Holthausen et al. (1995) | Effects of bonus plans bounds on discretionary accruals. | Compustat firms, over the 1970 and 1980 period. | Used the modified Jones (1991) method to estimate discretionary accruals. | Find evidence consistent with Healy hypothesis only at the upper bound. |
| Gaver and Gaver (1998) | Investigate the relation between accounting earnings and the cash compensation of CEOs. | 376 out of 500 firms from the *Forbes* annual compensation survey between 1971–1997. | Focusing on CEO cash compensation. | There is a negative association between managerial ownership and the magnitude of accounting accrual adjustments as well as positively related to the information content of earnings. |
| Guidry et al. (1999) | Test the Healy hypothesis for business–unit managers. | Sample of 102 firms over the 1980–1990 period. | Internal data within a single corporation. | Results support Healy's bonus plans hypothesis, nevertheless, they found when earnings before discretionary accruals fall below the lower bounds, managers select income–increasing discretionary accruals (and vice versa). |

An analysis of this table reveals that most studies attempt to build on the contribution made by Healy (1985). Healy's (1985) empirical study is considered as a benchmark for many subsequent bonus maximizations investigations. He examined earnings–based bonus schemes which became a popular method of rewarding corporate executives during the 1980s. It is logical to believe that managers whose remuneration is partially–based on the level of profit will manipulate this profit figure to maximise their remuneration over time. Healy tests the association between (a) managers' decisions about accruals[62] and accounting procedures and (b) the incentives coming from their compensation packages. Two classes of tests are presented: accrual tests and tests of changes in accounting procedures. The results of Healy's study indicate that managers are more likely to choose income–decreasing accruals when their bonus plans' upper or lower bounds are binding and income–increasing accruals when these bounds are not binding. His results suggest that bonus plans motivate management to select accrual and accounting procedures that maximise the present value of their own bonuses. Further, the adoption or modification of a bonus plan has a high probability of causing changes in accounting procedures. It is important to note that the detailed bonus information analysed by Healy (1985) is difficult to collect. In a given sample, the number of firms describing the details of bonus plans can be too small for appropriate statistical analysis (Field et al., 2001).

Despite shortcomings in Healy's methodology (e.g. using total accruals as the

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[62] Accruals management refers to changing estimates such as useful lives, the probability of recovering debtors and other year end accruals to try to alter reported earnings in the direction of a desired target (Ayres, 1994). There are five well–known models of discretionary accruals in the literature. These are: the Healy (1985) model, the DeAngelo (1986) model, the industry model used in Dechow and Sloan (1991), the Jones (1991) model, and the modified–Jones model which is employed by Dechow et al. (1995). The Jones and modified–Jones models are most widely used because they appear to be powerful in detecting earnings management (see Dechow et al., 1995). Different authors have used different ways to define discretionary accruals. See Appendix 3-1 for a description of discretionary accruals measurement.

proxy for discretionary accruals), his results on upper and lower bounds has become a starting point for many subsequent compensation studies. For example, Guidry et al. (1999) found evidence which supports Healy's bonus plans hypothesis. They discovered that divisional managers for a large multinational firm are likely to defer income when the earnings target in their bonus plans will not be met and when they are entitled to the maximum bonuses permitted under the plan. However, contrary to Healy (1985), they found that when earnings before discretionary accruals fall below the lower bounds, managers select income–increasing discretionary accruals (and vice versa). They believe that these results are more consistent with the income–smoothing hypothesis than with Healy's bonus plan hypothesis.

Gaver et al. (1995) and Holthausen et al. (1995) document results that are consistent with Healy's hypothesis only at the upper bound level. They find no evidence that managers manipulate earnings downward when earnings are below the minimum necessary to receive their bonus and thus reach different conclusions about managerial incentives around the lower bound. While Gaver et al. refer to the income–smoothing hypothesis when explaining their results, Holthausen et al. (1995), using more sophisticated data, suggest that variation in research design could explain the differences in the empirical results between Healy's investigation and their findings at the lower bound. They argued that Healy had to estimate the region of the bonus contract (upper bound, lower bound or in between) whereas they had actual data on the bounds. Healy used total accruals as a proxy for discretionary accruals whereas Holthausen et al. employed a modified Jones (1991)[63] method to estimate discretionary accruals. Further, Healy's data was for the period 1930–1980 and Holthausen et al.

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[63] See Appendix 3-1 for a description of discretionary accruals measurement.

claim that incentive bonus plans changed significantly in the l970s and 1980s.

Using data on cash compensation for CEOs of bank holding companies, Clinch and Magliolo (1993) investigated whether accounting changes which had no effects on cash flows had an impact on CEO compensation. They concluded that the discretionary treatment of specific accounting items did not affect the managers' compensation if it was not accompanied by a significant cash flow effect. In a more recent study, Gaver and Gaver (1998) investigated the relationship between accounting earnings and cash compensation. They found a negative association between managerial ownership and the magnitude of accounting accrual adjustments as well as a positive relationship between managerial ownership and the information content of earnings.

#### *3.4.2.2 Debt contracts*

Debt contracts are concerned with external agency conflicts between a firm's managers and its providers of fixed income capital; they are widely researched in the literature. The contracting cost arguments suggest that accounting methods are selected to minimize agency costs among the various parties to the firm and, in so doing, maximize firm value. Managers of firms that are close to violating debt covenant[64] restrictions have incentives to choose income–increasing accounting methods in an effort to maximize the value of the firm by avoidance or reduction of the costs associated with violation of explicit or implicit restrictions. Research to test the impact of bond covenants on accounting method choices hypothesizes that managers select or

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[64] The consequences of violating accounting-based debt covenants could be: "(a) termination of the lending agreement; (b) demand for immediate repayment of the loan; (c) increased collateral; (d) increased interest rate; (e) imposition of additional constraints; and (f) waiver of the violation" (Gopalakrishnan and Parkash, 1995, p. 20).

change accounting methods to avoid covenant violations; this has become known as the "debt hypothesis":

> "The larger a firm's debt/equity ratio, the more likely the firm's manager is to select accounting procedures that shift reported earnings from future periods to the current period" (Watts and Zimmerman, 1986, p. 216).

Studies involving debt covenant restrictions have typically relied on one or more proxy measures in the literature such as the debt/assets and/or debt/equity ratios (Bowen et al., 1981; Daley and Vigeland, 1983; Ayres, 1986; Duke and Hunt, 1990; Press and Weintrop, 1990; DeFond and Jiambalvo, 1994; Sweeney, 1994; Gopalakrishnan, 1994; Dichev and Skinner, 2002). The assumption is therefore that at higher levels of leverage, debt covenant restrictions are more likely to bite. Most studies that have included leverage as an independent variable have found results consistent with the debt/equity hypothesis. That is, across a variety of accounting policy choices, managers of highly levered firms are more likely to use income–increasing accounting methods (DeFond and Jiambalvo, 1994; Sweeney, 1994; Gopalakrishnan, 1994).

For example, DeFond and Jiambalvo (1994) test this hypothesis on firms that reported debt covenant violations. They find that in the year preceding (and in the year of) the violation, abnormal total accruals and abnormal working capital accruals are both consistent with the debt hypothesis. Using a sample of 130 firms that were first–time violators of their debt covenants between 1980 and 1989, Sweeney (1994) examines the probability of default for debt covenants with certain accounting methods (e.g. LIFO vs. FIFO). He finds that the defaulting firms made significantly more voluntary income increasing accounting policy changes than the control sample firms whose debt covenants remained intact. He also finds that despite financial reporting

benefits, firms will not switch to FIFO if the change generates significant tax costs. Gopalakrishnan (1994) builds upon this analysis by analysing the debt hypothesis for unlevered firms using a direct test of certain accounting methods (e.g. the SLD vs. accelerated method depreciation and LIFO vs. FIFO). The results indicate that the higher the leverage, the greater the likelihood of choosing SLD and /or FIFO.

On the other hand, a numbers of studies find results inconsistent with debt hypothesis. For example, DeAngelo et al. (1994) test accounting choices in firms that experience a persistent problem with their level of profit. They used data of 76 firms from the NYSE which reported at least three years of losses over the period 1980–85 and that reduced dividends as a result; 29 firms in the sample cut their dividends due to binding debt covenants. They hypothesized that firms facing potentially binding debt covenants have greater incentives to make income–increasing accounting choices than firms without such binding debt covenants. They found very little difference between troubled and untroubled companies and no real significant income increasing procedures being adopted. As a result, they concluded that the accounting choices reflected the firms' financial difficulties rather than attempts to either avoid debt covenant violation or mask the financial difficulties. Selected empirical studies of debt hypothesis are summarized in Table 3-3.

**Table 3-3 Selected empirical studies of debt hypothesis**

| Author (s) | Motivation | Sample | Methodology | Results |
|---|---|---|---|---|
| DeFond and Jiambalvo (1994) | Test debt hypothesis on firms that reported debt covenant violations. | 94 firms from the NAARS database disclosing a violation between 1985 and 1988. | They assess whether the sample firms manipulate accruals rather than making specific accounting method changes. | In the year preceding and in the year of the violation, abnormal total accruals and abnormal working capital accruals are both positive, consistent with the debt hypothesis. |
| Sweeney (1994) | Test debt hypothesis with certain accounting methods. | 130 firms first time violators (1980–89) with data on Compustat. | Direct test of the use of certain accounting methods, e.g. LIFO vs. FIFO. | Significant associated with debt/hypothesis. |
| Gopalakrishnan 1994 | Test debt hypothesis on small firms. | Firms that do not have long–term debt and small firms on Compustat Sample include 727 and 690 firms reporting depreciation and inventory method choices. | Direct test of the use of certain accounting methods, SLD vs. accelerated method and LIFO vs. FIFO. | The results indicate that:<br>-The higher the leverage, the greater the likelihood of choosing SLD and/or FIFO.<br>-Political cost hypothesis does not seem to apply to smaller firms. |
| DeAngelo, et al. (1994) | Test the apparent importance of actual debt covenant violations on accounting choices. | Sample of 76 financially troubled firms that reduced dividends, 29 of which did so due to binding debt covenants. | Direct test of the use of certain accounting methods. | They find no statistical difference in the accounting choices made by the two groups of firms and conclude that the accounting choices reflected the firms' financial difficulties rather than attempts to either avoid debt covenant violation or mask the financial difficulties. |

### 3.4.3 Asset pricing and capital market

The expectation underlying the asset pricing goal hypothesis is that managers will attempt to influence asset prices by making specific accounting choices when such influence may be possible because of information asymmetry. The basic focus in this category of research is to solve problems which arise when markets imperfectly reflect information held by the managers[65].

The association between earnings and share price was first documented by Ball and Brown (1968)[66]. They examined whether accounting choices that have no direct cash flow implications are associated with changes in share prices. Their results appear to be inconsistent with market efficiency and could be explained in several ways (see Kothari, 2001). These include investor irrationality (e.g. investors mechanically respond to levels or changes in earnings regardless of their source), managerial signalling (e.g. managers provide private information through their accounting choices that influence the beliefs of rational investors) and contractual motivations (e.g. managers avoid violating debt covenants thereby maximizing the value of the firm). Subsequent studies have examined the association between accounting numbers and share prices or returns through investigating whether choice of accounting methods affects either equity valuation or the cost of capital (e.g. see Watts, 1992). This research is extensively reviewed by Kothari (2001). The most significant conclusion of this research is that regulated financial reports provide relevant information to investors.

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[65] This research uses correlation with stock returns as a criterion for evaluating accounting methods. The maintained hypothesis is that capital markets are efficient. In recent years, market efficiency has been subjected to significant empirical assault.

[66] Specially, Ball and Brown (1968) documented that for their sample of US firms, positive unexpected annual earnings are associated with positive abnormal returns while negative unexpected annual earnings are associated with negative abnormal returns. Ball and Brown discovered that this relationship (which was stronger for earnings than for cash flows) was anticipated by the stock market several months before the disclosure date.

This area of research also examines whether accounting method choice affects equity valuation or the cost of capital. Typically studies focus on capital market reactions to discretionary accounting choices. Probably the most widely studied area in this literature is the valuation implications of discretionary accruals. Investigations by Warfield et al. (1995) and Wang and Williams (1994) find a negative association between the extent of accruals management and the information content of earnings (consistent with the opportunistic accrual management hypothesis). Other studies find that discretionary accruals have positive valuation implications (consistent with the signalling role of the accrual management hypothesis). For example, Hunt et al. (1996) and Subramanyam (1996) show that smoothing of earnings via discretionary accruals is associated with higher earnings multiples. In addition, Guay et al. (1996) and Subramanyam (1996) document a positive and significant relation between discretionary accruals and annual share returns. Kasznik (1999) reports that US firms with managers that overestimated earnings have significant levels of positive discretionary accruals. Management ostensibly make such choices to avoid the negative market reaction anticipated from the announcement of earnings that fall short of the target or expected earnings (Kasznik, 1999). However, the incentives among the sample firms to manage accruals upward are also consistent with the compensation and debt hypotheses outlined earlier[67].

Many studies examine whether discretionary accruals influence share prices by focusing on specific situations such as takeovers. Erickson and Wang (1999) hypothesize that bidders will manage earnings upwards via discretionary accruals in an

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[67] A number of UK studies have also considered this issue. For example, Ali and Pope (1995) document a strong stock market reaction for earnings over cash flows which they attribute to the information content of accruals. Clubb (1995) builds upon this analysis by discovering that abnormal returns for UK firms are related more to short–term rather than long–term accruals.

attempt to increase the share price and thereby decrease the number of shares that must be issued to complete a deal. They find evidence consistent with their expectations. However, using a variety of different research designs, Lev and Zarowin (1999) find that in the USA the relationship between share returns and earnings (and between share prices, earnings and book values) have deteriorated over time.

This category of research also deals with disclosure policies and examines the relationship between accounting information (voluntary disclosure) and the role of financial reporting for capital markets[68].

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[68] Voluntary disclosure theory hypothesizes that, managers use corporate disclosures to reduce the likelihood of undervaluation and to justify poor earnings performance. Healy and Palepu (2001) reviewed recent empirical studies on voluntary disclosure and summarize five motives for such managerial disclosure decisions: capital market transactions, corporate control contests, stock compensation, litigation and proprietary costs. These explain why managers increase the extent of disclosure in general, but there is no obvious reason to expect that these factors would systematically vary with managers' incentives. Firstly, the capital markets transactions hypothesis is motivated by a prediction that managers who anticipate making capital market transactions such as security issues have incentives to provide voluntary disclosures to reduce the information asymmetry problem (Healy and Palepu, 2001), thereby reducing the firm's cost of external financing (Healy and Palepu, 1993; 1995). For example, a sizable literature documents that these equity issues by firms are associated with returns of –3% (Asquith and Mullins, 1986; Barclay and Litzenberger, 1988; Burton et al., 1999; Spiess and Affleck–Graves, 1999). This effect exists independently of the size of the issue, the purpose of the issue and the potential usage of the proceeds. Studies of the market response to debt issues also document a negative market response which is typically much less than that for news of equity issue (Hansen and Crutchley, 1990; Burton et al., 1996). Thus, managers who seek to reduce their cost of capital appear to be more inclined to increase voluntary disclosure to reduce information risk through. Secondly, the corporate control contest hypothesis is motivated by evidence that boards of directors and investors hold managers accountable for current stock performance (Healy and Palepu, 2001). Brennan (1999) finds that target firms in takeover situations are more likely to issue management forecasts of earnings during contested bids. An exception to this general statements concerns situations where disclosing firms are larger (Imhoff, 1978), less risky (Ruland, 1978) and have good news to volunteer to the market (Waymire, 1985). Third, the stock compensation hypothesis is motivated by the expectation that firms which use stock compensation extensively are likely to provide additional disclosure to reduce the risk of misvaluation. According this hypothesis, stock–based compensation plans provide incentives for mangers to undertake voluntary disclosures. Stock compensation is more likely to be an efficient form of remuneration for managers and owners if share prices are an adequate reflection of firm values. Fourth the litigation cost hypothesis predicts that the risk of legal exposure influences CEOs' decisions about whether to publish forward–looking information to investors. Skinner (1994) suggests that firms not only voluntarily disclose good news, but also bad news to preempt large negative earnings surprises and thereby avoid the risk of litigation. Thus, this hypothesis presumes that in the absence of litigation managers have an incentive to time the disclosure of good and bad news symmetrically. Fifth, the proprietary cost hypothesis predicts that firms' decisions to provide additional disclosure is biased by an expectation that such disclosures can affect their competitive position in product markets (see e.g. Newman and Sansing, 1993).

### 3.4.4 Influence on third parties (political costs)

The third potential motivation for accounting choices is concerned with interventions by third parties. This branch of research deals with the influence of external parties other than actual and potential owners of the firm: for example, government regulators, competitors and union negotiators. Many researchers have implicitly assumed that large companies may be viewed with suspicion, so that large companies earning high levels of income may be perceived as exploiting external parties unreasonably. Such perceptions could result in decisions by such parties which are costly to the firm. By making accounting choices that influence accounting numbers, managers may influence the decisions of such parties. This possibility is reflected in the political costs hypothesis. The most common hypothesis considered here is that firms select accounting methods to reduce or defer taxes and to avoid potential regulation. In the PAT literature, the tax effect considers whether firms choose accounting methods to minimise the present value of taxes. In the case of firms that have probable increases in inventory costs, the choice of LIFO results in an associated rise in the incremental cash inflows associated with tax savings; on the basis of this reasoning, managers would be expected to choose LIFO. However, in the case of firms with conflicting goals, managers may not choose LIFO (see Fields et al., 2001).

A large body of research focusing on the tax consequences of accounting decisions has considered the choice between LIFO and FIFO for tax purposes. Maydew (1997), Scholes et al. (1992) and Guenther (1994) investigated intertemporal shifts in income by profitable firms that were induced by tax changes. Eilifsen et al. (1999) showed that if taxable income was linked to accounting income, there exists an automatic safeguard against the manipulation of accounting choices within the analysed

framework. In summary, the tax–related accounting choice research reports evidence that firms make accounting choices in order to reduce their tax burden and thus increase their cash flows.

On the other hand, most of the research into the effect of regulation on accounting choices is based on industry specific regulations. It has been suggested that managers choose accounting methods and procedures to increase shareholder wealth. One cluster of research focuses on the regulatory costs imposed by capital adequacy ratio guidelines (see Bowen et al., 2000). Companies in regulated industries are particularly useful settings for book–tax comparisons because their mandated disclosures are more extensive than other firms and their production functions are relatively simple. Mikhail (1999) examined life insurers, noting that public and private firms differ for at least two reasons: (i) public firms compensation schemes are designed to mitigate agency costs and (ii) public firms are concerned about the stock market interpretations of reduced earnings associated with tax planning. To differentiate between these two explanations, Mikhail examined mutual life insurers, which have diffuse ownership and concurrent agency costs similar to public firms. Mikhail found that mutual insurers did not manage taxes. He concluded that public firms' incentive compensation contracts account for their difference from private companies, rather than stock market pressures.

Han and Wang (1998) investigate whether firms that expect increases in earnings resulting from sudden product price rises use accounting accruals to reduce earnings and, thus, political costs. Specifically, they focus on oil firms' accruals in a period of rapid petrol price increases during the 1990 Gulf crisis. Their results indicated that oil firms that expected to profit from the crisis used accruals to reduce their reported

quarterly earnings during the Gulf crisis. In contrast to previous research, they found that the tendency to release good earnings news early was reversed for oil firms during this crisis.

It has been argued that, since accounting techniques influence reported income, the political process may result in the choice of accounting techniques that adversely affect a firm's actual cash flows (Fields et al., 2001). This suggests that managers of firms facing political pressure are more likely to choose income–decreasing accounting methods to avoid the political costs associated with high visibility. Because firm size typically serves as a proxy for political pressure, this hypothesis is generally known as the "size hypothesis":

> "The larger the firm, the more likely the managers is to choose accounting procedures that defer reported earnings from current to future periods" (Watts and Zimmerman, 1986, p. 235).

A number of studies have documented results that are consistent with the political costs hypothesis. That is, across a variety of accounting method choices, managers of larger firms are more likely to choose income–decreasing accounting methods. For example, Hagerman and Zmijewski (1979) reported evidence that firm size is correlated with the choice of depreciation method and investment tax credit method, but not with the choice of inventory method or pension cost amortization period. They argued that their results reflected the fact that, for the population that they studied, depreciation methods and investment tax credit accounting methods have no direct cash flow effects. In contrast, inventory valuation and pension cost amortization methods do have direct effects on cash flows. This result suggests that many managers may consider political costs only when making accounting policy decisions involving accounting choices which do not affect cash flows directly.

A number of points emerge from the above discussion in section 3.4. Overall, empirical studies of PAT provide evidence that managers change accounting methods or accrual estimates to reduce the costs of violating bond covenants when they are written in terms of accounting numbers. They also appear to make accounting choices in order to increase the value of earnings–based bonuses under compensation contracts and to reduce the level of taxes paid.

## 3.5 Closing remarks

In order to develop the hypotheses employed in this thesis, the current chapter has introduced the theoretical framework and reviewed the literature about the determinants of firms' accounting choices. After reviewing the pertinent literature, it is clear that many of the studies have focused on companies in Western countries, especially in the USA. There is a lack of research focusing on developing countries such as Egypt. The influence of contracting costs on firms' accounting choices emerges from the three fundamental hypotheses of PAT. One can argue that "contracting costs" are based on three distinctive contracting relationships: two explicit and one implicit. The two explicit contracts relate to compensation agreements between managers and owners as well as lending agreements between owners/managers and bondholders (agency conflict). The implicit contract refers to the creation of political pressures (Watts and Zimmerman, 1978). The implicit contract is between companies that operate in a country and the government representing the citizens. It could be argued that implicitly citizens allow companies to operate within the border of their country as long as these companies do not harm or exploit them. The various governments (state and local) act as agents on behalf of the citizens. Furthermore, the ownership structure may be expected to influence the differing extents to which the PAT hypotheses are relevant

for owner and manager-controlled firms.

The current study is concerned with the influence of various economic factors on managers' accounting choices by testing existing positive accounting theory in an Egyptian environment. The economic factors that are considered in the current study are the contracting costs within the context of ownership structure (see Figure 3-1).

The general question arises: are major PAT hypotheses that are well supported in the USA and other developed countries valid in the Egyptian environment? This general question is further developed into three testable hypotheses applied to the two sets of ownership structure in the next chapter. These hypotheses heavily depend on the perception that agency relationships affect accounting choices.

# Chapter 4: Development of the Empirical Hypotheses

## 4.1 Introduction

The previous chapter highlighted why firms with different characteristics might be expected to adopt different disclosure and measurement practices (Watts and Zimmerman, 1976, 1986, 1990; Zmijewski and Hagerman, 1981). PAT hypothesises that managers will exercise accounting choices to increase or decrease corporate income in order to meet their objectives. The theory suggests that the firm's choices may be influenced by particular firm attributes such as the existence of a bonus plan, leverage and size.

Larger firms which may be subject to political costs, may adopt income reducing policy choices such as accelerated rather than SLD. The policy choices of firms financed with sizeable amount of debt may be influenced more by requirements of loan covenants than other firms. Firms with higher leverage may prefer income increasing policy choices if terms in loan covenants relating to the level of income are at risk of being broken. On the other hand, income–increasing policies, such as SLD and/or asset–increasing policies, involving the revaluation of assets or the capitalisation of expenditure, may be preferred where this has a favourable impact (from the lender's perspective) on financial ratios. In addition, it has been argued that a firm's ownership appears to be related to accounting choices and suggests that studies which have ignored ownership structure are incomplete and possibly misleading (Hunt, 1986). Thus, examinations of the potential relations between corporate ownership and accounting choices are necessary to provide a more complete theory of accounting choices and to assist in further development of a theory of the firm (Ibid). Thus far, the literature presents evidence suggesting that there is a relationship between ownership structure and at least some accounting choices (Dhaliwal et al., 1982; Abdel Khalik,

1985; Hunt, 1986; Penno and Simon, 1986; Niehaus, 1989; Carlson and Bathala, 1997). However, this literature is limited by the manner in which ownership is measured.

A large body of accounting literature tests predictions of PAT. The preceding chapter synthesized this body of literature since Watts and Zimmerman (1978) initially published their ground–breaking article. Management's economic motives for accounting choices tend to be grouped into three categories (see Chapter 3). Within each category, various uses of firms' accounting information may influence management's choice of accounting methods. For example, management may choose accounting methods in order to influence the outcomes of contracts that explicitly rely on accounting numbers (e.g. compensation contracts and debt contracts). In addition to representing the interests of accounting information users, managers are likely to operate in their own interest when there is conflict between the different categories. After reviewing the literature one can argue that, while the evidence to date supports perceptions that economic self–interest and/or firm characteristics motivate manager's accounting choice decisions in some Western countries (primarily in the USA), it is uncertain whether economic self–interest and/or firm characteristics dominate manager's accounting choice decisions in developing countries, such as Egypt; a developing state with a recently re–established capital market. Furthermore, this literature is limited by the manner in the theorising of the link between ownership structure and PAT hypotheses.

## 4.2 The fundamental hypotheses and the Egyptian context

As mentioned in Chapter 2, until the early 1990s, Egypt had a largely managed economy. From 1993 to 1996, however, the stock market grew by more than 17 times as the government implemented a large–scale privatisation plan. This change has

increased the relative importance of investors and shareholders and increased the importance attaching to the quality of accounting reports. External reporting requirements were imposed in 1997 by EASs. These standards are mainly a translation of IASs[69].

Applying IASs is mandatory for all companies reporting to the CMA under the provisions of Law 95 (Capital Markets Law) in Egypt. This includes all companies listed on the ESE as well as all specialised investment companies. Since 1998, most other companies in Egypt are required to comply with EASs, which are, in all material respects, the same as IASs. These standards have also been adopted as a part of the Uniform Accounting System that forms the basis of financial reports prepared by state–owned enterprises.

Egypt provides an interesting environment for the study of PAT hypotheses. As of the end of March 2003, there were 1,151 companies listed on the stock exchange. Nevertheless, a majority of firms quoted on that exchange are primarily owned by small numbers of shareholders or families (World Bank Report, 2001). Within the economy as a whole, there are still significant numbers of relatively large businesses that are similarly closely owned and controlled. Furthermore, the government pursues taxation policies intended to encourage the expansion of businesses that potentially provide employment to its citizens. These policies produce differing, and often extensive, periods of relief from business taxation. Within this context, successful business growth will probably be valued – indeed it might even be rewarded by government agencies. Cultural studies (e.g. Gray, 1988; Nobes, 1998) as well as

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[69] In October 1998 the Group of Seven leading industrial nations adopted these IASs as the appropriate global financial reporting standards. At approximately the same time, the World Bank challenged auditors to refuse to give "clean opinions" on financial statements not prepared in accordance with internationally acceptable standards. Appropriately, all companies listed on the ESE must follow IASs.

contingency theory studies (Doupnik and Salter, 1995) identify reasons at a macro level that are likely to cause differences in accounting practices across various countries. Consequently, conventional PAT hypotheses may be quite inappropriate; the setting therefore provides an interesting research site. This thesis aims to test existing PAT theories in the Egyptian environment by constructing and testing hypotheses concerning Egyptian businesses. The following sections outline these hypotheses in more detail; these hypotheses heavily depend on the perception that agency relationships affect accounting choices.

### 4.2.1 Ownership/control and bonus plans contracts hypotheses

Bonus schemes provide a means of rewarding and punishing performance of managers (Smith and Watts, 1982; Healy, 1985; Watts and Zimmerman, 1986; Sloan, 1993). Bonus scheme contracts are one approach to reduce agency conflicts between a firm's managers and its owners (see Chapter 3). The usual hypothesis is that managers with bonus schemes directly tied to accounting earnings are more likely to choose income–increasing accounting methods[70]. This suggests that managers select accounting methods in order to affect wealth transfers from the firm's owners and shareholders.

The relationship between the ownership/control status of firms and the accounting methods they adopt is examined in the literature (e.g., Amihud et al., 1983; and Dempsey et al., 1993; Short, 1994). The findings from these studies are that manager–controlled firms which are characterized by a diffuse ownership structure

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[70] Ittner et al. (1997) found no evidence that the choice of performance measures in bonus contracts was associated with the level of financial distress or the value of CEO equity holdings relative to their salary and bonuses. They also lent no support for the hypothesis that CEOs with greater influence over the board of directors were more likely to be compensated based on non–financial measures.

where no one individual has a controlling interest are more likely to manage earnings than their owner–controlled counterparts, and to do so more frequently[71].

Accounting earnings are expected to possess a variety of desirable characteristics that other performance measures do not have, including objectivity, reliability, verifiability and conservatism (Watts and Zimmerman, 1986, pp. 205–207). Further, accounting earnings are a more appropriate basis measure on which to evaluate a manager's performance and calculate a manager's compensation than other measures such as share prices and realised cash flows (Healy, 1985; Sloan, 1993; Emanuel et al., 2003)[72]. Consequently, managers may be motivated to maximize such earnings (Zmijewski and Hagerman, 1981). Sloan (1993) suggests that share prices are influenced by market factors that are outside the control of management and that may not therefore directly result from the manager's actions[73]. Moreover, Dechow (1994) suggests that realised cash flows do not provide a timely measure of the effect of the manager's actions on firm performance, especially when performance is measured over short intervals. He argues that managers' compensation contracts almost invariably specify only one summary performance variable (e.g., earnings). However, Hall (2002)

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[71] Two theoretical arguments are used to support this correlation finding. The first argument is based on the managerial economics literature, which basically suggests that managers have incentives to make accounting choices and report accounting income in the most positive way in order to obscure poor managerial performance and to keep shareholders satisfied (Hindley, 1970). But these incentives depend on the ownership structure of the firm. The second argument is based on agency theory as articulated by Jensen and Meckling (1976) where management bonus plans are more frequently link management remuneration and reported accounting earnings. The arguments of Watts and Zimmerman's positive theory are consistent with the view of managerial economists. Subsequent studies utilised agency theory to generate the prediction that manager–controlled firms are more likely than owner controlled firms to adopt accounting methods which increase reported earnings (see Zmijewski and Hagerman, 1981).

[72] Other studies document a significant statistical association between variants of accounting earnings and incentive–pay programmes (e.g. Antle and Smith, 1985; Lambert and Larcker, 1987; Jensen and Murphy, 1990; Dechow, 1994).

[73] Sloan found that the use of earnings–based as compared to share price–based performance measures is greater in firms where the share price is more subject to systematic influences; as measured by the firm's beta.

documents that although the amount of stock price–based pay (as a fraction of total top executive pay) in 1990 was less than 10%, it had grown to about 30% by 1992 and over 60% by the end of the decade in the USA. The vast majority of this trend was accounted for by a growth in the use of executive stock options[74].

One could assume that the decisions of executives in manager–controlled firms are unlikely to be as tightly constrained by the owners as those in owner–controlled firms. This assumption leads to the hypothesis that manager–controlled firms are more likely than owner–controlled firms to choose income–increasing accounting methods in order to maximise their personal utility (see Chapter 3). This means that the executives in manager–controlled firms are more likely to benefit from the selection of accounting methods which increase reported income than their counterparts in owner–controlled firms. The executives of owner–controlled firms do not have the same incentives to increase reported earnings as their counterparts in manager–controlled firms. In such a case, the ownership structures of firms operating in Egypt are likely to influence accounting choices[75]. Smith (1976) argues that the owner–managers of owner–controlled firms will be concerned with the acceleration of expense deductions for tax purposes and perhaps, for reporting purposes, in order to influence labour's bargaining position. This reasoning suggests that the executives in owner–controlled firms are more likely than the executives of manager–controlled firms to adopt accounting

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[74] Further, Feltham and Wu (2001) considered an explicit agency model and showed that such a result is sensitive to the functional relationship between effort and risk.

[75] In owner–controlled firms, the owners can motivate and monitor the behaviour of managers directly so the need for incentive compensation schemes based upon reported income is not great. On the other hand, the outside owners of management–controlled firms must devise mechanisms to motivate the firm's managers to act in a manner which does not ignore the interests of the outside owners. One common mechanism used for this purpose is the adoption of incentive compensation schemes, which depend upon reported income. Consequently, it is likely that management–controlled firms are more likely than owner–controlled firms to have incentive compensation schemes based upon reported income (see Chapter 3).

methods which lower or delay reported income. In other words, with defuse ownership the executives have an incentive to transfer wealth from shareholders to themselves because owners exert less control. The transfer of the wealth may be through the maximization of any bonus received. This suggests that bonus incentives may motivate manager–controlled firms' executives to select income–increasing accounting choices. In contrast, executives of owner–controlled firms may not have the same incentive to select income–increasing accounting choices. In Egypt, the stock exchange is still developing and the number of actively traded companies is small relative to the number of sizeable firms operating in the country. Further, management bonus contracts are usually based on accounting earnings (rather than share prices), which is implicitly recognized by the legal limit in Egypt of bonus remuneration: 10% of accounting earnings[76]. This study does not therefore examine relationships between equity–based incentives and accounting choices, but hypothesises a positive relationship between the use of bonus schemes and the adoption of income–increasing reporting methods. This hypothesis is consistent with evidence by Healy (1985), Gaver et al. (1995), Holthausen et al. (1995) and Guidry et al. (1999) which suggests that managers select accounting methods in order to affect wealth transfers from the firm's owners and shareholders.

Under this scenario, the following hypothesis is suggested with the expectation that it is relevant to Egyptian companies.

**H1:**

*Null:* In Egyptian firms, there is no association between employment of management bonus plans and adopting income–increasing accounting choices.

*Alternative:* In Egyptian firms, managers of firms with bonus plans are more likely to adopt income–increasing accounting choices than those without bonus plans.

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[76] The questionnaire survey included a question that directly referred to that area under discussion.

Egyptian company ownership structure is characterized by the prominent role afforded to the largest shareholder. This largest shareholder effectively controls the whole company by holding a significant proportion of equity. These owners usually participate in firm management directly or indirectly through close contact with key managers; they can influence most of the management decisions (Jensen and Meckling, 1976). In Egypt, the chairman of the board tends to be the managing director and many of the board members are major shareholders; the owner–managers dominate the management. Most boards are thus dominated by strong managers–owners. However, managers of Egyptian companies with widely dispersed share ownership frequently face little external supervision of their decisions and there may be conflicts between the interests of managers and shareholders[77]. Ownership structures therefore need to be considered as potential influences on accounting choices in Egypt. The largest shareholder owner behaves in a way to maximize firm value when the owner's holding is large; in this case, convergence of interest between the owners and managers occurs. Under this scenario, one would expect that the larger the owner's holdings, the lower the likelihood that income–increasing reporting methods will be adopted: a negative relationship. Jensen and Meckling (1976) suggest that convergence of interest could occur as the owner's holdings increase, reducing agency costs. The reduction in agency costs would be greater, the higher the holdings of the largest shareholder owner. In this case, the largest shareholder owner acts to maximize firm value and impose fewer contractual constraints on the firm. The owner will be motivated to increase the long–

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[77] See World Bank Corporate Governance Report (2001).

term value of the firm instead of increasing income[78]. However, in Egypt, owner-controlled firms may employ bonus plans if the large owners are not involved in the management and they employ professional individuals to represent them and manage the firms[79]. In such case, the executives of owner–controlled firms may be motivated to increase the reported earnings not only to maximise their personal benefits, but also to influence their reputation and increase the satisfaction of their employers.

Under this scenario, the hypothesis H1 can be divided according to the type of control and the following two sub-hypotheses are adopted.

**$H1_O$:**

*Null:* In Egyptian firms, there is no association between employment of management bonus plans and adopting income–increasing accounting choices in owner-controlled firms.

*Alternative:* In Egyptian firms, managers of owner-controlled firms with bonus plans are more likely to adopt income–increasing accounting choices.

**$H1_M$:**

*Null:* In Egyptian firms, there is no association between employment of management bonus plans and adopting income–increasing accounting choices in manager-controlled firms.

*Alternative:* In Egyptian firms, managers of manager-controlled firms with bonus plans are more likely to adopt income–increasing accounting choices.

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[78] Warfield et al. (1995) show that the proportion of shares held by insider owners (managerial ownership) is a significant determinant of discretionary accruals. Then again, in Egypt, many of the board members are major shareholders, owner–managers dominate the management, and these owners usually participate in firm management directly or indirectly through close contact with key managers. Boards are thus completely driven by strong managers–owners. Thus all owner controlled Egyptian firms tend to be managerial ownership.

[79] Under the Companies Law No. 159 of 1981, individuals or related group shareholders owning 10% or more of the total shares have a privilege to share in the management of the company or they can employ individuals to represent them and manage the firm.

The dependent variables most widely used in the literature are depreciation method, inventory method, the treatment of investment tax credits and the period of pension amortization (e.g. Hagerman and Zmijewski, 1979; Holthausen and Leftwich. 1983; Watts and Zimmerman, 1986; Penno and Simon, 1986; Dhaliwal, 1988: Press and Weintrop, 1990; Bowen et al., 2000; Bowen et al., 2002). Investment tax credits operate in the USA and some Western countries but not in Egypt. Also, pension amortization does not appear in the Egyptian income statements, because under EAS No. 21 the pension system is subject to a special fund system and the investment of this special fund has a separate financial statement. This study is therefore limited to the remaining variables of depreciation method and inventory valuation choices. Further, depreciation and inventory costs are usually large expense figures for Egyptian firms[80]. These variables should, however, be adequate because they can have large and systematic effects on the assets and expenses reported in firms' financial statements (Bowen et al., 2000; Bowen et al., 2002)[81]. It is generally argued in the literature that the adoption of (a) SLD and (b) the FIFO stock valuation method will increase reported earnings in the short–term. Arguments and evidence on p. 125 indicate that they are likely to increase current earnings in Egypt also. The sums involved in Egypt can be material. For example, using a random sample of ten firms from the database, the ratios of depreciation costs to the profits for years 2001 were 4.5, 0.2, 2.8, 0.5, 1.1, 1.1, 0.7, 0.3, 0.6 and 1.8. The sums involved in inventory are also likely to be material. Table 6-1 shows the industry classification of firms involved in the survey undertaken in this study. Similar industrial categories were found in the database. It will be observed that

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[80] Source:- Five interviews with financial officers in five different firms and five interviews with the chairmen of investors associations in five industrial cities in the target population.

many of the industries involved, for example, textile steel, chemical etc. necessary hold relatively high levels of inventory. These arguments are accepted for this study; thus, to test H1 and to follow the logic of the empirical tests reviewed in the literature that was discussed in the preceding chapter the following subsidiary hypotheses are adopted:

**$H1_a$:**

*Null:* In Egyptian firms, there is no association between the employment of management bonus plans and depreciation policy decisions.

*Alternative:* In Egyptian firms, managers of firms with bonus plans are more likely to choose SLD.

**$H1_b$:**

*Null:* In Egyptian firms, there is no association between the employment of management bonus plans and inventory policy decisions.

*Alternative:* In Egyptian firms, managers of firms with bonus plans are more likely to choose the FIFO inventory method.

Once again, the hypotheses $H1_a$ and $H1_b$ can be broken up according to the type of control and the following sub-hypotheses are adopted.

**$H1_{Oa}$:**

*Null:* In Egyptian firms, there is no association between employment of management bonus plans and depreciation policy decisions in owner-controlled firms.

*Alternative:* In Egyptian firms, managers of owner-controlled firms with bonus plans are more likely to choose SLD.

**$H1_{Ma}$:**

*Null:* In Egyptian firms, there is no association between employment of management bonus plans and depreciation policy decisions in manager-controlled firms.

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[81] Further, in a given sample, the number of firms has R&D cost can be too small for appropriate statistical analysis to be undertaken. Thus, this variable was also not considered for analysis.

*Alternative:* In Egyptian firms, managers of manager-controlled firms with bonus plans are more likely to choose SLD.

**$H1_{Ob}$:**

*Null:* In Egyptian firms, there is no association between employment of management bonus plans and inventory policy decisions in owner-controlled firms.

*Alternative:* In Egyptian firms, managers of owner-controlled firms with bonus plans are more likely to choose FIFO inventory method.

**$H1_{Mb}$:**

*Null:* In Egyptian firms, there is no association between employment of management bonus plans and inventory policy decisions in manager-controlled firms.

*Alternative:* In Egyptian firms, managers of manager-controlled firms with bonus plans are more likely to choose FIFO inventory method.

To empirically test hypotheses $H1_a$, $H1_{Oa}$, $H1_{Ma}$, $H1_b$, $H1_{Ob}$ and $H1_{Mb}$, the classification of the firms into bonus plans and non–bonus plans categories, as well as the determination of whether Egyptian firms can be split into owner–controlled and manager–controlled groups is specified in Chapter 5.

### 4.2.2 Debt contracts hypothesis

The literature about the use of accounting information by providers of capital deals with implicit claims, explicit contracts and general decision–making (Bowen et al., 2000). The extent to which firms rely on financing resulting in implicit claims by their creditors is expected to be positively associated with the likelihood of managers choosing income increasing accounting methods. The literature linking implicit claims, explicit contracts and accounting method choice generally focuses on long–term debt; it

also considers the existence of and/or the proximity to debt covenants explicitly written on reported accounting numbers (Duke and Hunt, 1990; Press and Weintrop, 1990; Sweeney, 1994)[82]. Violation of such covenants can impose costs on firms. Since income increasing accounting methods can loosen some covenants commonly observed in long–term debt contracts, management has an incentive to make income increasing accounting choices to avoid these costs. Therefore, the existence of debt covenants is expected to be positively associated with management's choice of income increasing accounting methods.

The debt hypothesis is one of the fundamental pillars of PAT (Watts and Zimmerman 1978 and 1986)[83]. The strength of the debt hypothesis depends on the costs of violating the firm's debt covenants (Holthausen and Leftwich, 1983). However, despite the large number of studies which have investigated this area, the evidence remains largely mixed[84]. The likelihood of violation of accounting related covenants normally cannot be observed directly using readily available data. Researchers have therefore employed the level of leverage as a proxy for the likelihood of this event, assuming that the higher the leverage, the greater the chance of a violation occurring. Furthermore, they have generally assumed that the likelihood of violation is

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[82] Empirical studies that examine the link between investor decision–making and management's accounting choices generally focus on short–term incentives and accounting choices (Bowen et al., 2000). Dechow et al. (1996b) examine management's use of income increasing discretionary accrual choices prior to equity issues. They argue that management has incentives to choose income–increasing accruals in order to influence investors' decision making and, thus, the firms' cost of capital. Burton et al. (1996) confirm this view with UK data where profitability declined significantly following an equity issue.

[83] The idea of this hypothesis is that, managers have incentives to make financial reporting decisions that reduce the likelihood that accounting based covenants in their firms' debt agreements will be violated (see Chapter 3).

[84] DeFond and Jiambalvo (1994) and Sweeney (1994) found results which were supportive of the debt covenant hypothesis. However, Healy and Palepu (1990) and DeAngelo et al. (1994) documented results that were inconsistent with debt covenant hypothesis (see Chapter 3).

reduced when the level of a firm's income increases (see, for example DeFond and Jiambalvo, 1994; Sweeney, 1994). Given the absence of more appropriate proxies in Egypt, this investigation adopts gearing as the independent variable and income increasing accounting methods as the dependent variables in the current investigation.

Most prior research examined Western corporations which borrow through the issuance of long–term bonds. In contrast, the banks constitute the main source of funds for Egyptian industry; indeed, in a number of cases they also own some of the share capital. Relationships and contracts with Egyptian lenders may therefore be significantly different to those in Western capitalist economies. Given this situation, the debt covenant hypothesis may not offer the same explanatory power for the accounting choices of Egyptian companies as in most previously published studies. Nevertheless, most Egyptian corporations rely on debt; financial statements are used to convey information about the borrowing firm's credit status to banks and other lenders. The conventional debt covenant hypothesis may therefore be expected to be relevant to Egypt because of the possibility that gearing affects the perceptions of potential and present lenders. Evidence on whether Egyptian managers' choices are consistent with an intention to reduce the likelihood that their firms will violate accounting–based debt covenants can be gained by testing hypothesis H2:

**H2:**

*Null:* In Egyptian firms, there is no association between the use of income–increasing reporting methods and leverage.

*Alternative:* In Egyptian firms, the use of income–increasing reporting methods is positively associated with leverage.

Closely-held firms are more likely to obtain a greater level of corporate debt as compared to firms with widely-held firms (Kim and Sorenson, 1986; Jensen and

Meckling, 1976). As mentioned in Chapter 3, while the conditions of the debt covenants are often expressed in terms of accounting figures, the accounting methods employed can partially determine whether or not a firm is able to meet the debt covenants. Consequently, to avoid debt covenant violations, even executives of closely–held firms may have an incentive to choose a reporting method which yields higher rather than lower reported earnings (Cloyd et al., 1996). The hypothesis H2 can be divided according to the type of control and the following two sub-hypotheses are adopted.

**$H2_O$:**

*Null:* In Egyptian firms, there is no association between the use of income–increasing reporting methods and leverage in owner-controlled firms.

*Alternative:* In Egyptian firms, the use of income–increasing reporting methods is positively associated with leverage in owner-controlled firms.

**$H2_M$:**

*Null:* In Egyptian firms, there is no association between the use of income–increasing reporting methods and leverage in manager-controlled firms.

*Alternative:* In Egyptian firms, the use of income–increasing reporting methods is positively associated with leverage in manager-controlled firms.

As in the hypothesis H1, the hypothesis H2 can be divided into two subsidiary hypotheses:

**$H2_a$:**

*Null:* In Egyptian firms, there is no association between the level of the leverage and the choice of SLD method.

*Alternative:* In Egyptian firms, the higher the leverage, the greater the likelihood that a firm will choose the SLD method.

**$H2_b$:**

*Null:* In Egyptian firms, there is no association between the level of the leverage and the choice of the FIFO inventory valuation method.

*Alternative:* In Egyptian firms, the higher the leverage, the greater the likelihood that a firm will choose the FIFO inventory method.

Once again, the hypotheses $H1_a$ and $H1_b$ can be divided according to the type of control and the following sub-hypotheses are adopted.

**$H2_{Oa}$:**

*Null:* In Egyptian firms, there is no association between the level of the leverage and the choice of SLD method in owner-controlled firms.

*Alternative:* In Egyptian firms, the higher the leverage, the greater the likelihood that an owner-controlled firm will choose the SLD method.

**$H2_{Ma}$:**

*Null:* In Egyptian firms, there is no association between the level of the leverage and the choice of SLD method in manager-controlled firms.

*Alternative:* In Egyptian firms, the higher the leverage, the greater the likelihood that a manager-controlled firm will choose the SLD method.

**$H2_{Ob}$:**

*Null:* In Egyptian firms, there is no association between the level of the leverage and the choice of FIFO inventory valuation method in owner-controlled firms.

*Alternative:* In Egyptian firms, the higher the leverage, the greater the likelihood that an owner-controlled firm will choose the FIFO inventory method.

**$H2_{Mb}$:**

*Null:* In Egyptian firms, there is no association between the level of the leverage and the choice of the FIFO inventory valuation method in manager-controlled firms.

*Alternative:* In Egyptian firms, the higher the leverage, the greater the likelihood that a manager-controlled firm will choose the FIFO inventory method.

To empirically test $H2_a$, $H2_{Oa}$, $H2_{Ma}$, $H2_b$, $H2_{Ob}$ and $H2_{Mb}$, leverage must be measured and the measurement of this variable is specified in Chapter 5.

### 4.2.3 Political visibility hypothesis

Tests about political visibility are also known as investigations of the "size hypothesis" (Watts and Zimmerman, 1986, p. 235). The conventional hypothesis considered in the literature is that firms select accounting methods to reduce or defer taxes and to avoid potential regulation (political costs)[85]. The tax–related accounting choice research documents evidence that firms make accounting choices in order to reduce their tax burden and thus increase their cash flows[86]. This result is not surprising because managers are unlikely to forgo tax savings without convincing reasons[87]. In the tax research literature, competing motivations often exist for accounting choices.

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[85] However, contrary to size hypothesis, Daley and Vigeland (1983) found that the association between size (sales) and the choice of R&D is significant only for their subsample of smaller firms. Lee and Hsieh (1985) and El-Gazzar et al. (1986) reported that a firm's size does not reflect differences in the political costs of firms. In addition, Aitken and Loftus (1994) identify all relevant alternative accounting policy choices and the dollar effect of each accounting policy choice. Whereas the results lend no support to the political costs hypothesis, the bonus plan hypothesis is supported. They attribute the confusing results in previous studies to using sample firms from heterogeneous industries. They suggest that accounting policy choices are likely to be industry–specific.

[86] There is a suggestion that managers may consider political costs only when making accounting policy decisions involving accounting choices which do not affect cash flows directly. However using LIFO led to a positive affect on the firm's cash flow because the choice of LIFO results in incremental cash inflows due to tax savings; value–maximizing managers would thus be expected to choose LIFO. Thus it is desirable that firms with high political costs adopt the LIFO inventory method (Holthausen and Leftwich, 1983). For example, Hagerman and Zmijewski (1979) documented evidences that firm size is correlated with the choice of depreciation methods and investment tax credit methods, but not with the choice of inventory methods or pension cost amortization periods. They reported suggestion that their results reflect the fact that depreciation methods and investment tax credit accounting methods have no direct cash flow effects. In contrast, inventory valuation and pension cost amortization methods do have direct effects on cash flows. This result suggests that many managers may consider political costs only when making accounting policy decisions involving accounting choices which do not affect cash flows directly.

[87] However, using the characteristics of US public companies in the period 1975 to 1984, Cushing and LeClere (1992) found that while expected tax savings is the firms' primary reason for using LIFO, other firms do not use LIFO because of numerous factors; no single reason dominated. Such factors as LIFO bookkeeping costs, increasing production costs, the effects on debt covenants and the requirements of FIFO for government contracts diminished the potential tax savings from LIFO.

Income taxes represent an implicit contract between the government and the citizen: they explicitly rely on accounting numbers. Taxation of profits may be the most direct form of wealth transfer. One might have expected therefore that larger firms would face higher tax rates than their smaller–sized counterparts. Using effective tax rates as a proxy for political costs, Zimmerman (1983) found some evidence that large firms have higher effective tax rates than smaller companies, thus in effect reducing their political costs. He discovered that this relationship varied over time and was largely driven by oil industry firms, suggesting that firm size is a noisy proxy for political costs.

On the other hand, one could argue that although larger firms may face higher political costs, they may reap greater political benefits; for example, profitable government contracts, import restrictions, easier access to finance. Due to their size, therefore larger firms may be politically powerful and consequently enjoy higher political benefits. In Egypt there are strong links between the state apparatus and the large firm sector. The state has encouraged large firms because of their significant affect on the unemployment and economic prosperity. On the other hand, the tax rate in Egypt rises to 40%, so the largest firms find the incentive to reduce their reported income. However, investment incentives are a prominent feature of Egyptian tax policy, where the preferred form is a tax holiday. In Egypt tax holidays are used to promote certain activities and to encourage new industries. Tax holidays vary from between 5 and 20 years and extend to lifetime exemptions from certain taxes in the case of tax free zone investments. Thus, although it might be assumed that large Egyptian companies will face significant political costs, the reverse may in fact apply; instead,

they may enjoy significant political benefits[88]. Nevertheless, for the purposes of the current analysis, this study adopts the conventional PAT political costs hypothesis that the larger Egyptian firms are more likely to adopt income–decreasing accounting methods to reduce political costs than smaller businesses.

Due to monitoring costs, company size and higher company profits are proxies for possible extreme expectations of the probability of harmful or exploitative behaviour by companies. Past studies often used size (measured by total assets and/or total sales) as a proxy for political sensitivity. Nevertheless, size may be a proxy for factors other than political sensitivity[89]. For example, the operating characteristics of smaller firms may be significantly different from those of larger firms (e.g.. greater default risk). Thus, it seems possible that accounting method behaviour may differ based on the size of the firm because of factors other than political sensitivity. A more direct measure of political sensitivity may therefore be needed. A possible proxy for political sensitivity is the number of employees, since they are one of the political groups for each company and unions may be able to lobby effectively. This does not seem to be appropriate in Egypt, however, because employees in Egypt are not unionised or adept at imposing political pressure on their companies. Furthermore, Egyptian firms that employ 50 or more people can claim a five–year tax holiday, reflecting governmental support for high levels of employment. One can argue that, the enterprise level and workers may not have incentives to reduce reported income by

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[88] These political benefits may include the introduction of accounting standards that can contribute to a reduction in the level of firm's tax liability.

[89] Ball and Foster (1982) as well as Zimmerman (1983) indicate that firm size is a noisy proxy variable for political costs and has been used to proxy for other factors. Furthermore, Whittred and Zimmer (1992) indicate that political costs are likely to be a function of numerous factors; for example, the nature of the industry, the number of employees or customers as potential voters, and geographical location. El-Gazar et al. (1986) argued that the level of effective tax rates may be a more appropriate proxy than the size about firm's political costs because taxes are supposed to be the most direct way for wealth transfer.

choosing income–decreasing methods to weaken the bargaining position of their unions in Egypt. This study has therefore rejected levels of employment as a proxy for political sensitivity. In the absence of an acceptable alternative, size has therefore been used to proxy for political sensitivity. The following hypothesis is therefore suggested here to test the relevance of the conventional PAT political costs hypothesis in Egypt.

**H3:**

*Null:* In Egyptian firms, there is no association between the size of the firm and the use of income–increasing reporting methods;

*Alternative:* In Egyptian firms, managers of larger firms are less likely than those of smaller firms to adopt income–increasing accounting choices.

The hypothesis H3 can be divided according to the type of control and the following two sub-hypotheses are adopted.

**$H3_O$:**

*Null:* In Egyptian firms, there is no association between the size of the firm and the use of income–increasing reporting methods in owner-controlled firms.

*Alternative:* In Egyptian firms, managers of larger owner-controlled firms are less likely than those of smaller firms to adopt income–increasing accounting choices.

**$H3_M$:**

*Null:* In Egyptian firms, there is no association between the size of the firm and the use of income–increasing reporting methods in manager-controlled firms.

*Alternative:* In Egyptian firms, managers of larger manager-controlled firms are less likely than those of smaller firms to adopt income–increasing accounting choices.

Large firms may use both depreciation and inventory valuation methods for decreasing accounting income. Consequently, H3 could be represented by $H3_a$ and $H3_b$ as follows:

**$H3_a$:**

*Null:* In Egyptian firms, there is no association between the size of the firm and the use of SLD method

*Alternative:* In Egyptian firms, the larger the firm, the lesser the likelihood it will choose the SLD method.

**$H3_b$:**

*Null:* In Egyptian firms, there is no association between the size of the firm and the use of FIFO inventory valuation method.

*Alternative:* In Egyptian firms, the larger the firm, the lesser the likelihood it will choose the FIFO inventory method.

Once again, as in the preceding hypotheses, the hypothesis $H3_a$ and $H3_b$ can be divided according to the type of control and the following sub-hypotheses are adopted.

**$H3_{Oa}$:**

*Null:* In Egyptian firms, there is no association between the size of the owner-controlled firm and the use of SLD method

*Alternative:* In Egyptian firms, the larger the owner-controlled firm, the lesser the likelihood it will choose the SLD method.

**$H3_{Ma}$:**

*Null:* In Egyptian firms, there is no association between the size of the manager-controlled firm and the use of SLD method

*Alternative:* In Egyptian firms, the larger the manager-controlled firm, the lesser the likelihood it will choose the SLD method.

**$H3_{Ob}$:**

*Null:* In Egyptian firms, there is no association between the size of the owner-controlled firm and the use of FIFO inventory valuation method.

*Alternative:* In Egyptian firms, the larger the owner-controlled firm, the lesser the likelihood it will choose the FIFO inventory method.

**$H3_{Mb}$:**

*Null:* In Egyptian firms, there is no association between the size of the manager-controlled firm and the use of FIFO inventory valuation method.

*Alternative:* In Egyptian firms, the larger the manager-controlled firm, the lesser the likelihood it will choose the FIFO inventory method.

To empirically test $H3_a$ $H3_{Oa}$, $H3_{Ma}$, $H3_b$, $H3_{Ob}$ and $H3_{Mb}$ predictions. it is necessary to measure the size of Egyptian firms. Previous studies have measured the size of the firms using both (a) total sales (SALES) and (b) total assets (ASSETS). (Watts and Zimmerman, 1978; Hagerman and Zmijewski, 1979; Kuo, 1993). The size of a firm is assumed to influence the political costs of a firm, since the larger the firm the more likely is that it will "attract" the attention of politicians as a potential target for a wealth transfer.

## 4.3 Summary

This chapter has presented the operational hypotheses developed for the purposes of this study. The general research question is further developed into three testable hypotheses. The hypotheses were derived from the conventional PAT predictions and split into the form of owner-controlled and manager-controlled firms. Each hypothesis is divided to two subsidiary hypotheses concerned with the association between a firm's characteristics (independent variables) and the aspect of a firm's accounting policy decisions concerning depreciation and inventory valuation methods, (the dependent variables). It has been hypothesised that, *ceteris paribus,* managers of firm that employ management bonus plans are more likely to adopt income–increasing methods. This hypothesis is derived from the bonus plans hypothesis. A second hypothesis is derived from the debt contracting costs hypothesis, which suggests that

the use of income increasing reporting methods is positively associated with the leverage. The third hypothesis is derived from the conventional political costs hypothesis, which suggests that managers of large firms are less likely to use an accounting change to increase earnings than are managers of smaller firms.

Details of variable definitions, variables measurement, data collection and sample, as well as how all the hypotheses are analysed are discussed in the next chapter.

# Chapter 5: Research Design and Methodology

## 5.1 Introduction: purpose of chapter and overview

For the purposes of the current study, the operational hypotheses about the accounting choices of Egyptian corporations were developed in Chapter 4. It is necessary to empirically investigate the stated hypotheses. The development of the research plan is a prerequisite for this empirical testing. Research methodology is "the application of scientific procedures towards acquiring answers to a wide variety of research questions" (Adams and Schvaneveldt, 1991, p. 16). It provides the tools to enable the researcher to underpin the work and obtain useful findings. Methodology incorporates the entire process of a study: that is, conceptualising the problem, developing the research questions to be investigated, data collection and data analysis as well as generalisation from the results.

The present chapter introduces the research design and outline the methodology needed to investigate the hypotheses that were stated in Chapter 4. It describes the companies selected for the purposes of this investigation and the sources of data used in this study. Previous studies have provided the basis for selecting the research methods employed. These methods include a questionnaire survey and an analysis of the financial statements that were included in an Egyptian database. The data obtained using these methods are then statistically analysed in order to determine if significant conclusions can be arrived at using both univariate and multivariate analysis. In certain circumstances, the data derived from the questionnaire survey and the database have been compared and discussed.

The remainder of this chapter is split into seven areas. The research design of the study is described in section 5.2. Section 5.3 discusses the population characteristics, the sampling procedure and the units of analysis. Methods for data collection adopted

are discussed in section 5.4. Variables and the measurement scales that are used in the analysis are described in section 5.5. Section 5.6 is concerned with the validity and reliability of the research. Within section 5.7 the statistical analyses and level of significant are presented and discussed. The chapter concludes with section 5.8, where a synopsis of the research plan of this study is provided.

## 5.2 Research design

A sound literature review "gives a good basic framework to proceed further with the investigation" by clarifying the research problem and identifying likely variables (Sekaran, 1992, p. 38). Research design is concerned with how to conduct the research and what methods to use. Research design has been referred to as "a master plan specifying the methods and procedures" (Zikmund, 1994, p. 42). The objectives of a particular study play a crucial role in developing the research design that will be followed (Sekaran, 1992). Positivist studies generally aim to test a theory in an attempt to increase our understanding of how phenomena might be predicted. Research is classified as positivist if there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing and the drawing of inferences about a phenomenon from the sample to a stated population (Guba and Lincoln, 1994).

In line with the "positive accounting theory" approach initiated by Watts and Zimmerman (1978), the current study aims to test some existing theories in an Egyptian context. The primary mode of the research inquiry in positivism is based on deduction (Layder, 1993). Use of the hypothetical–deductive approach leads to generalization from the statistical tests which are undertaken (Guba and Lincoln, 1994; Tsoukas, 1989). Data collection techniques include experiments and sample surveys. Data

collection is usually carried out with the researcher being remote from the phenomena under investigation rather than participating in the project[90].

The analytical process of the current study involved: reviewing the literature, exploring the relevant characteristics of the selected Egyptian businesses, formulating hypotheses, developing models, collecting data, analysing data, making comparisons and testing the formulated hypotheses. Thus, certain hypotheses have been formulated and tested on the accounting choices of Egyptian corporations. The hypotheses link a firm's depreciation–policy and inventory valuation decisions to its ownership structure, the existence of a management bonus plan, leverage and company size.

Earlier empirical studies of economic–consequences in accounting research primarily focus on established databases of financial information about quoted firms. They are concerned with examining and analysing actual data about various firms' characteristics and their accounting–policy decisions (see Tables 3-1, 3-2 and 3-3 in Chapter 3). This research approach often involves the examination of statistical associations between variables which are either directly derived from publicly available information sources – in most cases, the financial statements – or estimated on the basis of data included in accounting reports – e.g. financial ratios. Under certain circumstances, other information gathering devices can be employed, in conjunction with, or independently from, the analysis of databases. The questionnaire survey is usually employed when the relevant information is not readily obtainable through established financial databases. For example, Penno and Simon (1986), Cloyd et al. (1996) as well as Schulze and Dino (1998) employed a questionnaire survey in order to

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[90] Researcher participation tends to be a feature of other methodologies – specifically these adopting the interpretative paradigm (Burrell and Morgan, 1979). For example, according to the interpretative paradigm, reality does not exist independently of the researcher and methods such as interviews, case studies and ethnographic investigations tend to be employed (Hussey and Hussey, 1997).

collect information regarding the accounting policy decisions of private firms[91]. The dearth of available data about non–quoted firms' reporting strategies, compelled them to utilise a questionnaire survey to collect the necessary information.

In this study, only the financial reports of the most frequently–traded Egyptian companies are available in a database. The required information cannot be obtained from an examination of financial statements of non–traded firms on the ESE. Variables such as the usage of compensation plans and ownership structure which might be important in explaining a firm's depreciation and inventory valuation policy choices are not readily accessible. This information is unavailable for non–traded firms on the ESE from a readily available database. Also, the bases of accounting employed by non–traded firms are not obtainable from available databases. Moreover, an analysis of financial data may not be, by itself, sufficient for collecting all the necessary information regarding peoples' beliefs and opinions (Stelltiz et al., 1976). Thus one can argue that using a questionnaire survey to investigate respondents' opinions, beliefs and perceptions is considered necessary for investigating decisions about firms' reporting–methods[92]. Consequently, a questionnaire survey has been conducted.

Using SPSS software, the data collected from the questionnaire survey and from the database were independently analysed in two phases[93]. Following the example of previous research, a univariate analysis was initially used to examine the association

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[91] One reason cited by Penno and Simon (1986), Cloyd et al. (1996) as well as Schulze and Dino (1998) for using an experimental survey to conduct their tests is that archival data are not readily available on private firms.

[92] Furthermore, Blaikie (1993) argued that using two methods allows the researcher to (i) obtain a variety of information on the same issue; (ii) use the strength of each method to overcome the deficiencies of the other; (iii) achieve a higher degree of validity and reliability; and (iv) overcome the deficiencies of single–methods studies.

[93] In the first phase (Chapter 6), the descriptive statistics regarding the responses to the questionnaire survey and the variables used for the financial statements analysis are presented. In addition, the

between the dependent variable and each of the independent and control variables taken one at a time. A multivariate analysis was then undertaken. The multivariate analysis was used to examine the significance of the variables as a whole in explaining depreciation and inventory method choices. The results from the two data sets were then compared and discussed.

## 5.3 Population and sample selection

"Population refers to the entire group of people, event or things of interest that the researcher wishes to investigate" (Sekaran, 1992, p. 225). Most researchers are not able to survey the whole population and, accordingly, have to settle for a sample. Access to the whole population may not be possible or even feasible for a lot of researchers.

Two "samples" of companies were selected for scrutiny in the current work. First, the financial officers of firms in the Cairo area as well as in the Alexandria and Menoufia Governorates in Egypt were identified as the population for a questionnaire survey. These areas were chosen because they are the most industrialised areas in Egypt; most large Egyptian firms are concentrated there. The sample for the questionnaire survey consists of the 320 largest firms (classified by their working capital in the financial year, 2001)[94] drawn from the research population. The Egyptian Business & Finance Portal web as well as interviews with the chairmen of the investors

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association between certain variables is investigated. In the second phase (Chapter 7), the results of the statistical analysis, which aims to formally test the formulated hypotheses, are reported.

[94] Five interviews with the chairmen of investors associations in five industrial cities in Egypt confirmed this widely held view that most common way for classifying the largest firms is based on their working capital. Given the absence of more appropriate method in Egypt, the researcher used that approach to establish the largest firms because that basis was the only accessible source.

associations in five industrial cities[95] were used to determine the 320 largest firms in the population to be surveyed. Practical considerations contributed to the sample selection decision. During the pilot study for the questionnaire[96], a number of interviewees suggested that the researcher confine the sample of the questionnaire survey to the larger firms. They argued that larger firms, with organized public–relation offices, would be more likely to participate in the study and respond to the questionnaire survey than smaller companies. However, the main reason for concentrating the sample on the largest firms was that small businesses tended not to have an organized accounting function and consequently would not be able to contribute information relevant to the central objectives of this study. More than half of the respondent firms in the questionnaire survey are listed on the stock exchange, but they are classed as "rarely traded" firms.

Second, Egyptian firms quoted on the ESE were identified as the population for the database sample. A database of listed companies is available from three resources: (i) the CMA in Cairo which controls the stock market, (ii) the Disclosure Department at the CSE, which has a link with EGID for data display and (iii) Kompass Egypt which maintains a commercial database on businesses. Only the annual reports for the most frequently traded companies were complete in the databases[97]. These 118 most frequently traded companies were therefore selected as the sample for the current research study. Due to a lack of complete financial data that were required to construct

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[95] Precise details of the interviewees in the different cities cannot be revealed in order to preserve the anonymity of these chairmen. However two of the cities are in the Cairo area, one is in the Alexandria Governorate, and two are in the Menoufia Governorate.

[96] See the pilot study that is discussed in a subsequent section of this chapter.

[97] A large tax advantage is given to firms quoted on the exchange (there is a tax exemption for all companies listed on the Egyptian exchange). The magnitude of the subsidy led to many closely held companies being listed. Consequently, the ESE identifies listed companies as either (i) actively traded or (ii) rarely or not traded. The rarely traded companies are in most cases closely held.

the variables to be tested, other firms were omitted. The annual reports were collected for the 118 companies after paying a nominal fee to the three sources. Some of these firms were excluded because it was not possible to obtain their accounts for a consecutive three–year period which was necessary for the statistical analysis which was performed. The final sample includes 96 firms (see section 5.4.2). Thus, the sample of firms from the database included only companies for which complete financial statements were obtained. Since the relevant data were obtained from the records of the ESE, they refer only to listed and traded firms. The data were collected for the financial periods ending in 1999, 2000 and 2001. The empirical research took place during 2002.

Firms' ownership/control status in both samples of companies (questionnaire survey and database) was split into owner-controlled and manager-controlled (as a sub-population). A firm's ownership/control status is normally defined in the PAT literature on the basis of the percentage of the ownership of a firm's equity capital. Many studies have classified a firm as closely held, when one party controls more than 10% of its capital (see, Chapter 3); they have used dichotomous variables to classify firms into owner–controlled and manager–controlled categories based on this percentage. Such an approach has been adopted in the current study which classifies firms as either owner–controlled or manager–controlled using a zero–one dummy variable. Since the ownership required to call a shareholders meeting in firms listed on the ESE is 5% for ordinary meetings and 10% for extraordinary meetings[98] the current study utilises the

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[98] Since the Companies Law No. 159 of 1981 articulated that individuals or related group shareholders own 10% or more of the total shares of a company have a privilege to share in the management of the company or they can employ individuals to represent them and manage the company.

following ownership criterion (as that employed by many previous researchers)[99]. Specifically, if the percentage of equity owned by one owner (or related group) is equal or greater than 10%, then the firm is classified as owner–controlled. If the percentage is equal or less than 5%, the firm is classified as manager–controlled. Between 5% and 10%, the researcher was unsure about the type of control and companies in this region were omitted from the analysis. Consequently, respondents to the questionnaire survey were requested to indicate if one shareholder or one related group (for example, a family) owned 10% or more of the total share capital (question 5).

For firms included in the database, a firm was identified as an "owner–controlled" entity when one shareholder or related group (five shareholders) held equity capital equal or more than 10%. No electronic databases on the ownership of Egyptian firms exists therefore data on the identity and size of the largest five shareholders' holdings was collected by examining annual reports. This information on ownership structure was confirmed for about 70 firms using the Kompass Egypt Financial yearbook. Ownership structures for the remaining 26 firms were confirmed by examining details from the disclosure database of the CMA.

The researcher had to exercise judgement in choosing the cut–off level of ownership that is assumed to create a "sufficient incentive" for shareholders to engage in monitoring. In previous mostly American empirical research, concentration of ownership has been measured using cut–offs ranging from 5% to 10%; these percentages are employed to indicate that owners are likely to play an active role in the management of their firms (Tosi and Mejia, 1994). Egyptian firms are required to

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[99] More recent studies use of continuous classification. However, in Egypt the ownership required to call shareholders meeting is 5% for ordinary meeting and 10% for extraordinary meeting. Which suggest that the dichotomous classification is more appropriate.

report all individuals or institutions holding 3% or more of their shares (in American companies is 5%). The objective of this research is to test the existing PAT theories in an Egyptian environment; therefore, the researcher recognised that the current study has to be compatible with the literature and the cut–off levels of 5%> to <10% were utilised to indicate that owners are likely to be active in the management of their firms. The percentage used as cut–offs are consistent with those employed in past research[100] (e.g. Dhaliwal, 1982; 1988) where ownership structure was unchanged during the test period. This procedure defines fewer firms as being manager–controlled and therefore was deemed to be more appropriate to the Egyptian environment[101]

## 5.4 Research methods

As indicated above, the empirical study follows most preceding work in using an established database of financial data for firms quoted on the stock market. The investigation also analyses data from a questionnaire survey. This methodological expansion enables mutual validation of, and challenge to, the findings from each independent source. It also allows the study to be extended to large firms that are not quoted on the stock exchange and to companies that are, on average, smaller than the quoted firms. In addition, the ability to ask questions that cannot be measured by reference to a database provides a relatively rich source of information on the factors that managers *say* influence decisions. Given the objectives of this study, data were collected on the following items: firms' depreciation and inventory policies; firms' ownership structure; firms' leverage and size characteristics and existence of

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[100] The gap between the 5% and 10% ranges was considered a "grey–area" of ownership where the firm was neither manager–controlled nor owner–controlled.

[101] Overall no firms in the database were included in the cut–offs level.

management bonus plans. A summary of the research methods employed is presented in Table 5-1.

### 5.4.1 Questionnaire survey

#### *5.4.1.1 Pilot studies*

Before starting the research survey, pilot studies were held to assess the feasibility of the research project and to assess the validity of the research instrument. The first pilot study for testing the questionnaire was conducted at the Department of Accountancy and Business Finance at the University of Dundee. Members of the academic staff in the Department who have research experience with questionnaire surveys were asked to express their opinion regarding the validity of the research instrument; in particular, views were sought on the selection and wording of questions, the general aims of the instrument and the measures being ascertained. The staff recommended some rephrasing and restructuring of the questionnaire so that the questions more precisely conveyed their intended meaning.

Subsequently, a second pilot study was undertaken in Egypt. It was considered desirable to test the research instrument with professionals who have research experience within the Egyptian business environment. Three members of the academic staff who have undertaken research in Egypt were interviewed. One was a Professor of Accounting in the Zagazeg University (Zagazeg, Egypt) and was working as a consultant in the CMA in Cairo; the other two were lecturers in the Business Administration Department at Menoufia University (Shebin El–Kom, Egypt). These individuals also checked the translation of the questionnaire from English into Arabic.

**Table 5-1 A summary of the research methods employed**

| Research method | Population | Sample size | Access to data obtained via | Time Period |
|---|---|---|---|---|
| Questionnaire Survey | The financial officers of firms in the Cairo area as well as in the Alexandria and Menoufia Governorates in Egypt. | The 320 largest firms (classified by their working capital in the financial year, 2001). | • Egyptian Business & Finance Portal web.<br>• Five interviews with the chairmen of investors association in five industrial cities. | June–October 2002 |
| Database Analysis | Egyptian firms quoted on the ESE. | 96 out of 118 most frequently traded companies. | • CMA in Cairo.<br>• Disclosure at Cairo stock market.<br>• Kompass Egypt for business database. | January 1999–December 2001 |

A third pilot study including ten interviews was also undertaken in Egypt. Five interviews were with financial officers in five different firms[102] and five interviews were with the chairmen of investors associations in the five industrial cities that would be targeted with the questionnaire. The interviewees were asked about the applicability of the questionnaire (in terms of the terminology used and the range of size employed for certain quantitative variables concerning the size of the firm)[103]. Also, on the basis of their experience, the interviewees were asked (a) to indicate potential difficulties that the researcher might face during the questionnaire survey; (b) to express their opinion regarding the extent to which the issues under investigation were relevant within the Egyptian business environment; and (c) about the length of the questionnaire and the clarity of the questions.

First of all, the interviewees suggested that the study should focus on the larger firms in order to improve the response rate. They also mentioned that the academic terminology used in the questionnaire was at an appropriate level of sophistication for it to be well understood by the potential respondents. However, it was suggested that the ranges envisaged for the size variables had to be widened to include smaller companies in order to be suitable for Egyptian firms in the target population. They indicated that, in their opinion, the questions included in the questionnaire adequately identified the variables which they were indicated to measure. Regarding the length of the questionnaire, all the participants suggested that the questionnaire was short enough[104] and that all the questions were clear and understandable. However, they pointed out

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[102] These firms spanned three sectors: Textile, Building materials, Electrical appliances.

[103] Specifically, the size ranges for total sales, market value and total assets were all involved based on the recommendation of these interviewees.

[104] Since, a satisfactory response rate is more likely to be achieved in shorter questionnaire (Stelltiz et al., 1976). This issue was raised by the researcher in the interviews that were held.

that the major problem that the researcher would most likely face would be a very low response rate to a postal questionnaire survey. Consequently, they recommended personal administration of the questionnaire[105]. In addition they indicated that if the documents were distributed by Fax a higher response rate might be achieved than if the mail service was used; fax is the most frequently used method of sending documents from one business to another in the Egyptian environment[106].

They also pointed out that managers of Egyptian firms are very reluctant to participate in surveys either because they do not wish to do so or because their firms have a policy of not responding to such requests. Also, managers of Egyptian firms can be extremely suspicious and therefore reluctant to participate in research where findings may be published – particularly in the case of "sensitive questions". The interviewees recommended that the best way to achieve an adequate response rate was to establish personal contact with firms' financial officers and to personally administer the questionnaire. By establishing personal contact, the researcher would be in a position to explain the purpose of the survey and to outline the issues under investigation. Thus, financial officers might be prepared to participate.

On the basis of the above comments, modifications were made to the initial draft of the questionnaire. Although it was initially considered that only a postal questionnaire survey should be undertaken, it was decided that 50% of the questionnaires might be distributed by fax and in person. The personal distribution of the questionnaires was used when the geographical proximity of the target–sample

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[105] Personally–administration questionnaires allow the researcher to establish a report with the respondents during an introduction to a survey. On the other hand, personally administrated questionnaires are more expensive, especially, if the sample is geographically dispersed (Sekaran, 1992).

[106] Potential respondents who had already been surveyed in the pilot study were eliminated from the sample of firms target with the final version of the research instrument.

permitted it. In the case of the questionnaires that were sent via fax or through the mail. potential respondents were personally contacted by the researcher using a telephone to notify them that the survey instrument had been sent.

#### *5.4.1.2 Questionnaire distribution*

Closed–ended questions involving multi–choice questions were used in the questionnaire[107]. Respondents had to choose an answer from a list of predetermined replies. The focus of the questions was on firms' characteristics and their accounting–policy decisions. It was supposed that the respondents had relatively clear opinions regarding the issues being raised and so only a limited number of alternative answers was supplied. Rating scales – such as likert scales[108] – were used to allow the researcher to give a numerical value to a respondent's opinion. This type of question seems to be more suitable when respondents are expected to have a relatively clear opinion regarding the issues raised in the question and when questions aim to gather factual information (Stelltiz et al., 1976).

The questionnaire was distributed to the financial managers of the 320 largest firms operating in the Cairo area, the Alexandria Governorate and the Menoufia Governorate in Egypt. An appeal for co–operation was expressed via a letter signed by one of the supervisors of this thesis as well as a covering letter signed by the researcher; both were enclosed along with the questionnaire. In addition, the objectives of the study were outlined and an assurance of anonymity was given. Three weeks later

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[107] The final version of the questionnaire document is presented in Appendix 5-1.

[108] The likert technique presents a set of attitude statements. Respondents are asked to express an opinion based on a five-point scale. Each degree of agreement is given a numerical value from one to five. Thus a total numerical value can be calculated from all the responses.

a reminder was given to the non–respondents through telephone contact. One more call was made for those who had not completed the questionnaire three or four days after the first prompting. After the second reminder, no further attempt was made to contact the individuals. Questionnaires were faxed or hand delivered for at least 50% of the sample in order to address with the issue of a possibly low response rate. Thus, from the total sample of 320 questionnaires sent, 42 were personally delivered[109] while the remaining 278 were distributed through fax and mail. An analysis of the responses for the three different distribution methods is shown in Table 5-2.

**Table 5-2 A summary of the responses to the questionnaire survey**

| | Distributed (1) | Collected (2) | (3) = (2)/(1) (%) | (4) = (2)/93 (%) | (5) = (2)/320 (%) |
|---|---|---|---|---|---|
| Personal distribution | 42 | 30 | 71.4 | 32.3 | 9.4 |
| Fax distribution | 118 | 44 | 37.3 | 47.3 | 13.8 |
| Mail distribution | 160 | 19 | 11.9 | 20.4 | 5.9 |
| Total | 320 | 93 | — | 100.0 | 29.1 |

The overall response rate for this response project is 29%, since 93 out of the 320 questionnaires distributed were returned[110]. However, this overall rate masks differential responses for the different categories of delivery methods used. The response rate from the personal distribution was relatively high, since 30 out of 42 were collected (about 71%)[111]. In contrast, only 19 out of 160 questionnaires that were delivered by post were returned (about 12%). Thus, the predictions of those who took

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[109] The researcher made five visits to five different sub-areas in the target cities to deliver the questionnaire to the potential respondents. Each visit took two days; respectively 20-21 July 2002, 22-23 July 2002, 27-28 July 2002, 29-30 July 2002 and 3-4 August 2002.

[110] Moser and Kalton (1993) reveal that if the response rate is below the range of 20-30%, it is possible that serious bias has been introduced in the sample. Thus, it can be argued that the probability that the findings would be seriously biased may not be substantially high.

part in the pilot survey interviews turned out to be correct. Distribution of the questionnaires via personal contact or by fax proved to be relatively successful (Wallace and Mellor, 1988) while those sent in the post were relatively poor.

### 5.4.2 Database

As has already been pointed out, the empirical study follows most preceding work in the economic–consequences literature by using an established database of financial data for firms quoted on the stock market. The database contains various firms' characteristics and their accounting–policy decisions which directly, or after due adjustment, can be used for testing the hypotheses outlined in Chapter 4.

To obtain a sufficient set of data for a consecutive three–year period in order to estimate a logistic regression model three steps were taken. First, regulated and non–service firms (financial and insurance) were excluded from the sample because these firms were unlikely to have inventory or incur significant depreciation cost. Second, annual reports of firms were examined to determine the depreciation and inventory methods used by each firm for financial reporting purposes during 1999, 2000 and 2001 – firms that did not report depreciation method or did not supply details about the inventory valuation method were excluded from the sample. Third, firms which made a change in their depreciation method and/or inventory valuation method within the 1999–2001 period were excluded from the sample. The final sample included 96 firms. No electronic data on these Egyptian firms exist as the database involves paper–based files stored with the CMA, the EGID and Kompass Egypt, therefore, information for all of the 96 firms was collected and pre–processed manually from these paper files.

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[111] All of the 30 documents were collected personally at the same day of distribution; the remaining 12 documents did not arrive.

Overall, there was a small overlap between the respondents in the survey and the firms identified in the database[112]. More than half of the respondent firms in the questionnaire survey were listed on the stock exchange. Nevertheless, most were rarely or non–traded firms and hence not included in the database. For the purposes of statistical analysis, the two samples were kept separate and the same tests were applied independently to both samples[113].

## 5.5 The measurement of variables and model design.

The hypotheses have been formulated in the form of a relationship between independent and dependent variables. For testing the formulated hypothesis, it is crucial to determine what variables to use and how to measure them. The variables in this study were derived from the literature and categorized into dependent, independent and control variables. The measurement of the variables facilitates the use of statistical techniques and contributes in assessing the relationship between variables (Nachmias and Nachmias, 1976). Following previous research in the area, the choice of scale for the measurement of the variables was determined according to the nature of the variable being measured and the desired level of sophistication for the data analysis.

### 5.5.1 Accounting choices (dependent variables in the model)

To test whether or not firms base their choice of accounting methods on economic factors, it is necessary to identify which accounting procedures are most likely to be used. Evidence presented by Burgstahler and Dichev (1997) and

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[112] For example, only three companies were in both the questionnaire survey and the database sample. These companies cannot be named because anonymity was guaranteed but their identity is known to the researcher. Any test of companies between the two samples took this slight overlap into account.

[113] It would not be entirely satisfactory to amalgamate the two data sets directly, because of differences in the variables from one source to another, and because a few firms may be represented in both data sets.

Matsumoto (2002) suggests that managers use accounting discretion to avoid reporting negative earnings surprises. Most earlier studies that predict the choice of accounting techniques summarise the choice with dichotomous variables; tests of firms' choices among accounting techniques usually examine a particular choice(s) (e.g., depreciation method and/or inventory valuation method) in isolation from the set of other accounting methods employed by the firm (e.g. Hagerman and Zmijewski, 1979; Gopalakrishnan, 1994; Bowen et al., 2000; Bowen et al., 2002).

Two accounting alternatives were chosen as dependent variables in the current study: the depreciation policy and the inventory valuation decisions of the firms responding to the questionnaire survey and included in the database. These were selected because they can have large systematic effects on the assets and expenses reported in Egyptian firms' financial statements (see p. 94). They have also been observed as being material in the USA (Bowen et al., 2000). Further, they are usually disclosed in the corporation's annual reports.

FIFO will increase current earnings when there is inflation of inventory prices. The method would have consistently increased earnings in Egypt over the period 1994 to 2001 because inflation has always been positive in the range of 2.8% to 9.4% (see Table 2-1). SLD depreciation will always increase current profits but at the expense of profits some time in the future; all methods ultimately write off the same capital sum over the life of an asset. Managers may prefer present income to future income (of the same amount) because, if they receive earnings related bonuses, the amount of current earnings provides managers with opportunities to directly increase their immediate wealth and well-being - e.g. through increased remuneration, perquisites etc. and job security (by showing satisfactory amount of earnings). Furthermore, current wealth can be invested, so given high positive rates of interest in Egypt (see Table 2-1) potential

managers would prefer present income to future income of the same amount[114]. Consequently, subject to the details of the bonus plans, managers are likely to prefer higher to lower earnings. More specifically, the focus of interest is: (i) whether a firm adopts SLD or others and (ii) whether a firm adopts the FIFO for inventory valuation or some other alternative. A dummy variable was used to capture the dependent variables. In another words, the depreciation variable was coded one (1) if a particular firm was adopting SLD and zero (0) if it adopted other methods of depreciation[115]. Furthermore, the inventory variable was coded one (1) if a particular firm was adopting the FIFO method of inventory valuation and zero (0) if it adopted other methods of inventory valuation[116].

Respondents to the questionnaire survey were requested to indicate by answering two questions (Questions 14 and 20) whether or not the firm in which they were employed was making use of these two options. The responses to the two questions have been measured on a binary scale. For firms included in the database, an inspection of the bases of accounting that are highlighted in the notes to annual reports enabled the depreciation and inventory method choices to be identified[117].

### 5.5.2 Independent variables in the model

The economic factors considered in the current study that might influence a firm's choice of accounting methods are the management bonus schemes, a firm's

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[114] There is a lack of data on CEO turnover in Egypt.

[115] The only other method was reducing balance.

[116]The only other methods were weighted-average and LIFO.

[117] In the case of differences in the depreciation method used for different types of assets, the depreciation method that used for the fixed tangible depreciable assets (e.g., plant, machinery) has been used to identify the firm's depreciation method for the purpose of further analyses; since fixed tangible depreciable assets are more likely to spend the largest cost relative to other fixed assets.

leverage characteristics and a firm's size (see H1, H2 and H3).

#### *5.5.2.1 Bonus variable*

This study hypothesises that managers have incentives to use accounting choices that increase earnings if bonus schemes are based on these accounting earnings. Some prior studies have used a zero–one dummy variable to test the bonus hypothesis. This simplistic approach ignores the details of the bonus plans as well as the effect of total compensation on the accounting choice. Healy (1985), for example, has shown that the details of bonus plans are significant. Alternatives were not available to the researcher, however, because the details of compensation plans used by individual companies in Egypt were kept private. Consequently, the simplistic approach was the only one available and has been adopted in the current study; the details of bonus plans were not modelled in the analysis. Thus, the bonus variable (MP) in the current thesis was measured as one (1) if the managers have bonus plans based on accounting numbers and zero (0) if not.

Respondents to the questionnaire survey were asked whether their firms employed bonus plans or not (question 8). For firms included in the database, the distribution account was used to determine whether a firm employed bonus schemes[118].

#### *5.5.2.2 Leverage variable*

Previous studies have argued that firms with large amounts of debt relative to their equity (leverage) in their capital structure are more likely to choose accounting methods that result in higher or earlier reported earnings. The current study hypothesizes that the use of income increasing reporting methods is positively

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[118] The distribution account is a part of the financial statement published by Egyptian companies which details how the profit has been distributed to shareholders, managers and employees.

associated with leverage. The firm's total debt to total assets and long–term debt to equity ratios have been widely used as a proxy for a firm's dependency on debt financing (Duke and Hunt, 1990; Press and Weintrop, 1990; Healy and Palepu, 1990; DeAngelo et al., 1994; Jung and Kwon, 2002; Bauwhede et al., 2003). The same approach has been adopted in this study.

Questionnaire respondents were asked to indicate the proportion of their firm's total assets that was financed by debt capital (Question 12). The same approach was adopted for the database companies. On the basis of data being disclosed in the financial statements, the firm's debt to total assets and long–term debt to equity ratios were used. Both ratios were available for about 70 companies from the Kompass Egypt Yearbook (2001) and the ratios for the remaining 26 firms were computed by the researcher.

#### *5.5.2.3 Firm size variable*

Size has been used in the past as a proxy variable for political visibility (Pacecca, 1995); it is hypothesised to be positively associated with the usage of income–decreasing accounting methods. The political cost hypothesis states that managers of larger firms are more likely than those of smaller firms to adopt income–decreasing accounting choices in order to minimise their "political visibility". Hagerman and Zmijewski (1979) and Gopalakrishnan (1994) used both total sales and book value of assets as a proxy for the political cost.

In the questionnaire survey, size was measured using three measures: namely, current market value (SIZE1) (question 4), the total value of sales (SALES) (question 6) and the balance sheet value of the total assets reported in the most recent financial statements (ASSETS) (question 7). When determining the size measure to be employed

in the current analysis for the responses to the questionnaire survey, market value (SIZE1) was eliminated because many respondents did not provide this information. Thus, in both the questionnaire survey and the database, size is measured using (a) the total value of sales (SALES) and (b) the most recently reported balance sheet figure for the total assets (ASSETS). For all companies in the database firms, the "most recently reported balance sheet figure" related to the financial year ending in 2001. For the survey firms, the questionnaire specifically asked for the most recently reported figure.

### 5.5.3 Control variables

The hypothesized relationship between dependent and explanatory variables is influenced by other factors that should be controlled in the analysis. Hagerman and Zmijewski (1979) argued that firms with (i) high systematic risk, (ii) high capital intensity technology or (iii) belonging to industries which have high concentration ratios have incentives to reduce the mean of their reported earnings through choosing income decreasing accounting choices. Their argument is based on the belief that high accounting profits by firms with these characteristics are more likely to compensate investors for the additional risk being borne and to avoid attracting new competitor entrants into the sector. A similar approach has been adopted in the current study. The three variables suggested by Hagerman and Zmijewski (1979) are employed as controls in the current study; in addition, another two variables (PROFIT and TAXRATE) were also included as control measures.

The definition of risk in the current study is the beta coefficient from the market model[119] which is calculated as the volatility of the company's share relative to the

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[119] This model relates the return on a share ($R_{it}$) to a constant term plus a coefficient times the return on the market ($R_{mt}$): $R_{it} = \alpha + \beta R_{mt}$

volatility of the market as a whole. BETA coefficients were available for the 96 firms included in the database from the CMA in Cairo. They were computed using the daily returns around December 31, 2000 and a value weighted market index. Relative capital intensity (CI) was estimated by dividing fixed assets by total sales. As Hagerman and Zmijewski (1979) suggest, the concentration ratio (CR) is assumed to be a proxy variable for the ability of a firm to earn monopoly rents. It is measured by the eight largest firms' concentration ratios for their industries (their percentage of the sector's sales)[120]. Lilien et al. (1988) provide evidence that unsuccessful firms are more likely to choose income increasing accounting procedures than their successful counterparts (cited in Gopalakrishnan, 1994). Thus, PROFIT is also included as a control variable[121]. PROFIT is measured as the earnings before interest and taxes for the financial year divided by the book value of assets (Moh'd et al., 1998). In addition, since inventory method choices could be affected by tax incentives, TAXRATE is included as a control variable[122]. The TAXRATE is the firm's tax rate calculated by dividing the tax expense by net income before taxes.

### 5.5.4 The analysis

To identify the determinants of the cross–sectional variation in accounting choices, the current study adopts two approaches. First, univariate analysis is

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Where the model is normally estimated using ordinary least squares (OLS) regression. Accordingly, the coefficient on the return on the market variable is an unbiased estimate of the true beta of the share.

[120] Concentration ratios are used in this study as measures of monopoly rents because they are widely used and no better proxy is readily available, (see e.g. Hagerman and Zmijewski, 1979; Holthausen, and Leftwich, 1983; Press and Weintrop, 1990).

[121] Hence a return on assets measure is used to proxy for profitability in this thesis. The measure employed in the analysis relates to the same year in which the accounting choice is made.

[122] Zimmerman (1983) used the effective tax rates as a proxy for political costs. In addition El-Gazar et al. (1986) argued that the level of effective tax rates may be a more appropriate proxy than the size for firm's political costs because taxes can be argued to be the most direct way for wealth transfer.

undertaken where tests of association between the depreciation and inventory (dependent variables) and each of the independent variables are conducted. This association is measured for dummy variables (bonus plans versus no bonus plans) using a chi–square test; a 2 x 2 contingency table is examined. For the other categorical variables (LEV and SIZE) a Kendall's tau–b test is employed. The bivariate correlation has been utilized for testing the association between the control variables and dependent variables.

Second, multivariate analysis is performed using two specified models. These logit models are based on the cumulative logistic regression function. In the case of a single explanatory variable $x_i$ the model is as follows:

$$P_i = \frac{1}{1 + e^{-\alpha - \beta x_i}} \qquad [5.1]$$

where:

$Y_i$ is the dummy variable describing one of income increasing accounting method (e.g. $Y_i = 1$ if SLD is employed and = 0 if otherwise), $P_i$ is the probability that $Y_i = 1$, $\alpha$ is the constant, $\beta$ is the regression coefficient and $x_i$ is the value of the independent variable for company i (e.g. LEV). Equivalently, applying the logit transformation:

$$\text{In}\left[\frac{P_i}{1-P_i}\right] = \alpha + \beta x_i \qquad [5.2]$$

The corresponding formula for R explanatory variables is:

$$\log\left[\frac{P_i}{1-P_i}\right] = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \ldots\ldots\ldots \beta_k X_{ki} \qquad [5.3]$$

where:

$X_{hi}$ is the value of the $h^{th}$ variable for company i, $\beta_h$ is the regression coefficient for variable $X_h$ and $P_i/(1 - P_i)$ is the "odds ratio"[123].

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[123] The factor e is the factor by which the odds change when the kth independent variable increases by one unit. When $\beta$ is positive the factor $e^{\beta}$ will be greater than 1, and thus the odds will increase. On the

The form of the two regression models are as follows; predicted signs for the coefficients are shown in parentheses while the definitions and measurements of the variables included in these two regression models are presented in Table 5-3.

***Model 1:***

$$\log\left[\frac{P_{sl,i}}{(1-P_{sl,i})}\right] = \beta_0 + \beta_1 MP_i + \beta_2 LEV_i + \beta_3 SIZE_i + \beta_4 BETA_i + \beta_5 CI_i + \beta_6 CR_i + \beta\text{-} PROFIT_i \quad [5.4]$$

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Predicted signs | (+) | (+) | (-) | (-) | (-) | (-) | (-) |

Here, in model (1), *MP*, *LEV* and *SIZE* are the variables of interest. However, *BETA*, *CI*, *CR* and *PROFIT* are included as control variables. Consistent with the extant literature, $\beta_1$ and $\beta_2$ are predicted to be positive whereas $\beta_3$, $\beta_4$, $\beta_5$, $\beta_6$ and $\beta_7$ are predicted to be negative. Model (1) is used to test hypotheses $H1_a$, $H1_{Oa}$, $H1_{Ma}$, $H2_a$, $H2_{Oa}$, $H2_{Ma}$, $H3_a$, $H3_{Oa}$ and $H3_{Ma}$ that relate to depreciation policy choice.

***Model 2:***

$$\log\left[\frac{P_{fifo,i}}{(1-P_{fifo,i})}\right] = \beta_0 + \beta_1 MP_i + \beta_2 LEV_i + \beta_3 SIZE_i + \beta_4 BETA_i + \beta_5 CI_i + \beta_6 CR_i + \beta_7 PROFIT_i + \beta_8 TAXRATE_i \quad [5.5]$$

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Predicted signs | (+) | (+) | (-) | (-) | (-) | (-) | (-) | (-) |

In model (2), *MP*, *LEV* and *SIZE* are also the variables of interest. However *BETA*, *CI*, *CR*, *PROFIT* and *TAXRATE* are included as control variables. Once again, $\beta_1$ and $\beta_2$ are predicted to be positive whereas $\beta_3$, $\beta_4$, $\beta_5$, $\beta_6$, $\beta_7$ and $\beta_8$ are predicted to be negative. Model (2) is used to test hypotheses $H1_b$, $H1_{Ob}$, $H1_{Mb}$, $H2_b$, $H2_{Ob}$, $H2_{Mb}$, $H3_b$, $H3_{Ob}$ and $H3_{Mb}$ that relate to inventory valuation policy choice.

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other hand, if $\beta$ is negative the factor $e^{\beta}$ will be less than 1, and as a consequence, the odds will decrease.

**Table 5-3 Variables definition and measurement**

| Variable | Type of variable | Measurement method |
|---|---|---|
| Depreciation method *($P_{sl,i}$)* | Dependent variable | Coded one (1) if the firm *i* adopts SLD and zero (0) if the firm *i* adopts other methods of depreciation. |
| Inventory valuation method *($P_{fifo,i}$)* | Dependent variable | Coded one (1) if the firm *i* adopts FIFO method of inventory valuation and zero (0) if the firm i chooses other methods of inventory valuation. |
| Existence of Management incentive plans *($MP_i$)* | Independent variable | Coded one (1) if the managers have bonus plans based on accounting figures and zero (0) if not. |
| Leverage *($LEV_i$)* | Independent variable | The ratio computed by the company`s:<br>-Debt / total assets (LEV) and<br>-Long–term debt / equity (LEV1) |
| Firm Size *($SIZE_i$)* | Independent variable | Measured by using:<br>-Total sales (SALES) and<br>-Total assets (ASSETS). |
| Risk *($BETA_i$)* | Control variable | The firm–specific systematic risk measured by the company's beta estimated from the market model. Beta computed using the daily returns around December 31, 2000 and a value weighted market index. Beta was obtained from the CMA in Cairo. |
| Capital intensity *($CI_i$)* | Control variable | The fixed assets divided by total sales |
| Competition *($CR_i$)* | Control variable | Concentration ratios were measured by eight–firms concentration ratios for industries (percentage of sales). |
| $PROFIT_i$ | Control variable | Measured as earnings before interest and taxes for the financial year divided by the book value of assets. |
| $TAXRATE_i$ | Control variable | Tax expense divided by net income. |

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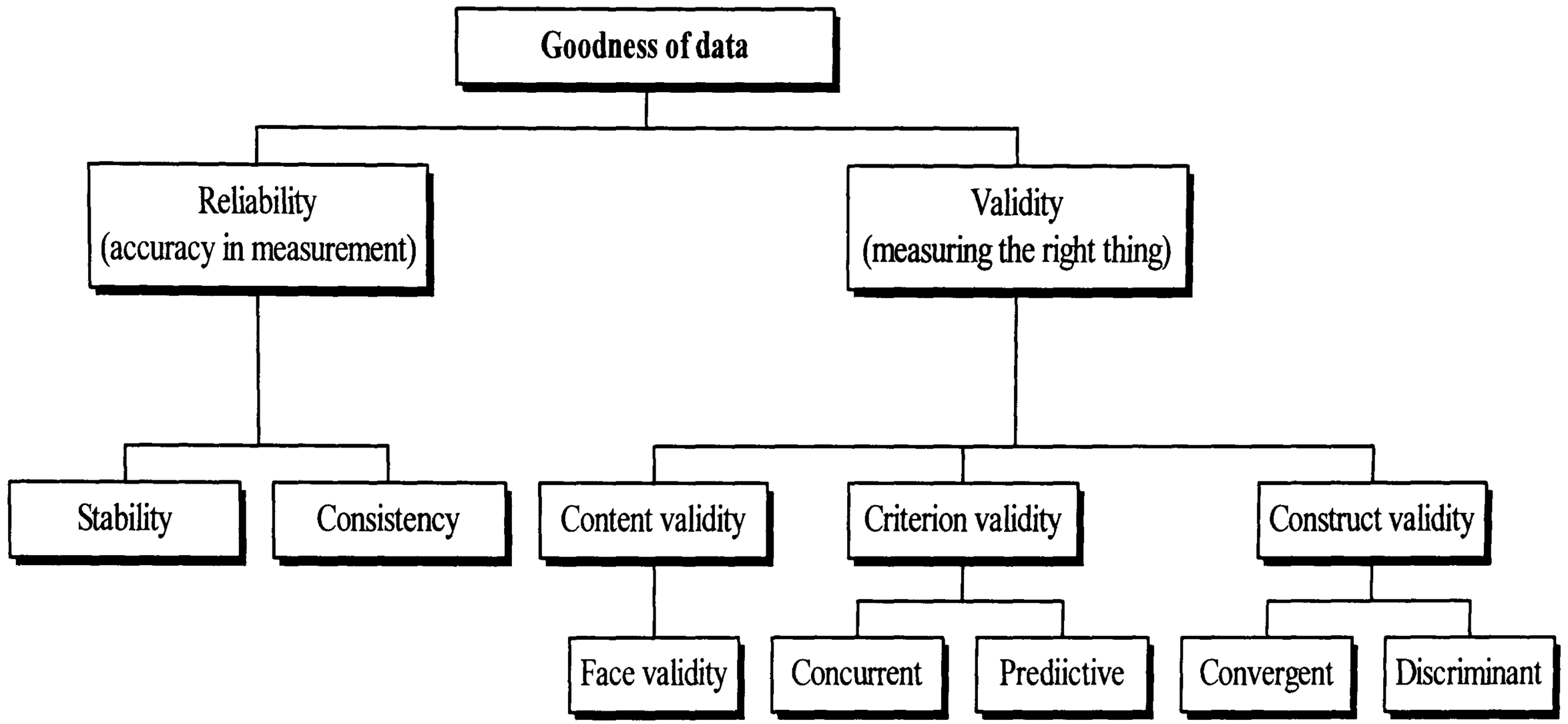
If $\beta$ is 0 the factor $e^{\beta}$ equals 1, the odds are unchanged.

## 5.6 Testing goodness of fit for the measures–validity and reliability

Positivists stress that reliability, validity and generalisability form the corner stones for judging research (Sarantakos, 1993; Abernethy et al., 1999). In a questionnaire survey, a number of factors can influence both the characteristics being measured and the measurement procedure itself (Stelltiz et al., 1976). The measuring instrument possibly reflects a number of errors. These errors can be identified as either constant and/or random errors. Constant errors are introduced by factors that systematically affect the variable being measured. Random errors refer to "...errors that differ from individual (or some other object) to individual during any one measuring instance and that vary from time to time for a given individual measured twice by the same instrument" (Stelltiz et al., 1976, p. 64-65). Validity is defined as the absence of constant and random errors. The validity of a test refers to the appropriateness, meaningfulness and usefulness of the specific inferences made from the test results (Dunn, 1989). Validity also refers to the results of a test and how they are interpreted; it is inferred from research findings and applied experience, using personal as well as generally accepted standards (Dunn, 1989). According to Stelltiz et al. (1976) it is extremely difficult to guarantee the complete validity of a measurement; nevertheless, it is crucial to provide some evidence that the measuring instrument actually measures what it presumed to measure.

There are three primary ways to assess validity (see Figure 5-1). First, "content validity" is primarily concerned with the selection and wording of items (questions), the aims of the instrument and what it is intended to measure. Face validity is the most common type of content validity.

**Figure 5-1 Testing goodness of fit for the measures (Validity and Reliability)**




Source: Dunn, 1989; Sarantakos, 1993; Zikmund, 1994; Abernethy et al., 1999

It is inferred from expert judgements and certain logical procedures (Dunn. 1989). Thus, face validity is generally assessed by asking potential respondents or expert panels who examine the relationship between test objectives and test items or by knowledge of the normal practices used to judge the appropriateness and relevance of items. There are no replicable rules for evaluating the face validity of a measuring instrument; therefore, the extent to which a measurement has face validity is a matter for the researcher's subjective judgement (Nachmias and Nachmias, 1976; Dunn. 1989).

In the current study, the following approach has been adopted. Each survey question was examined to check whether it adequately measured what it was presumed to measure in the pilot study. In addition, "experts" in the Department of Accountancy and Business Finance at University of Dundee as well as practitioners evaluated the questions that were being asked. Thus, one can say that the face validity of the questionnaire was supported.

Second, "criterion validity" refers to the ability of a measure to correlate with other measures of the same concept (Zikmund, 1994). There are two ways to assess criterion validity. The first is concurrent validity that refers to the ability of a scale to correlate with criterion measures of the same constructs when measured at the same time. The second is predictive validity that refers to the ability of a measure to predict future values or to correlate with criterion measures of the same construct measures later. In sum, the difference between concurrent and predictive validity is a different time horizon.

In this study an attempt has been made to assess the criterion validity of the research instrument. Database information and factual characteristics of firms have been adopted as external criteria.

Third, "construct validity" refers to the ability of a scale to confirm a network of related hypotheses that are based on a theory developed from constructs (Zikmund. 1994). Construct validity arises when the researcher is conducting statistical tests. Construct validity attempts to make sure that there is a consistent relationship between empirical evidence and the theoretical logic developed from the constructs. There are two types of construct validity. Convergent validity refers to the ability of a measure to have a high correlation with other measures of the same construct. Finally, discriminant validity refers to the ability of a measure to have a low correlation with measures of the different constructs.

Sekaran (1992) argues that methods of assessing validity for quantitative research include the ability to test hypotheses adequately (internal validity) and the ability to extend the results obtained to wider settings (external validity). Internal validity refers to whether or not the research is measuring what it is supposed to measure. External validity refers to the relationship between the results of the measured object and reality; it concentrates on how the results from one study can be applicable to other situations (i.e. how generalizable they are).

Internal validity in this study has been achieved by using two research methods. The questionnaires were sent to a person who has a great deal of knowledge in the subject area. Furthermore, the results are clearly presented (tests and tables), fully explained and interpreted in the thesis. The external validity of this study comes from the full description of how the study has been carried out, in order to help the reader understand how the results are achieved. The research design and the theoretical framework have been presented in order to avoid biased conclusions. External validity was achieved via the sampling method adopted and by deliberately sampling from a population.

Estimation of the reliability of the measurements refers only to the random errors. A reliable instrument is one that gives repeatable results. Reliability refers to a measure free from error and therefore yielding consistent results (Zikmund, 1994). Reliability occurs when a measure shows the same results over time and across different situations. Reliability in this research is assessed in terms of the stability of results generated through the application of some measurement instrument, such as a survey questionnaire and the collection of data from a database.

Overall, the researcher believes that the research procedures were both valid and reliable. Every attempt was made to ensure that validity and reliability were achieved. Of course no research is perfect and the existence of more complete information might have enabled the researcher to use different measures for a larger group of companies. Nevertheless, within the constrains that existed, the researcher believed that the choices made have been satisfied.

## 5.7 Statistical techniques and the level of significance

The financial data and the responses to the questionnaires were analysed to answer the research questions addressed in this study. The variables involved in the questionnaire survey and database were measured either on a nominal or an ordinal scale. For the hypotheses testing, both univariate and multivariate analyses were conducted (see Chapter 7). The aim of the univariate analysis was to examine the empirical validity of predictions relating to a particular economic motive rather than to examine the relative impact of all of the economic motives identified in the current study on management's accounting method choices. For the univariate analysis the chi–square test, using a 2 x 2 contingency table, was utilized to establish the association

between the dependent variables and the dichotomous independent variables: the relationship between the dependent variables and each of the categorical explanatory variables were investigated using non–parametric Kendall's tau–b test[124] of association for ordinal variables. Multivariate analysis is able to supply different perceptions and show which relationships are significant among the different predictions considered. The multivariate analysis aimed to indicate the significance of the variables as a whole in explaining the association of individual variables with the depreciation and inventory valuation policy decisions of firms. The empirical analysis of the proposed models has been conducted in a cross–sectional framework using logistic regression analysis[125]. Since the dependent variables are binary[126], the use of ordinary least squares (OLS) may result in predicted values which lie outside of the limits (0,1), and may lead to inefficient parameter estimates (Menard, 1995). The logit model is a technique which seeks efficient parameter estimates while recognizing the limitations placed on the dependent variable.

The logistic regression analysis proceeded in two stages. Throughout the first stage, the incremental tests were conducted to examine the contribution of each independent variable in explaining the dependent variable using the models developed for the purpose of the study. Throughout the second stage, the logistic regression analysis was conducted to indicate the accumulating explanatory power of the identified variables. A "backward elimination" search was conducted to obtain a clearer

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[124] Kendall's tau–b test is a non-parametric measure of association for ordinal or ranked variables that take ties into account. The sign of the coefficient indicates the direction of the relationship, and its absolute value indicates the strength, with larger absolute values indicating stronger relationships.

[125] Logistic regression analysis is employed when the dependent variable can take only two values.

[126] A firm either makes use of the relevant option or not; according to the depreciation method variable, a firm either makes use of the SLD or not; according to the inventory valuation method variable, a firm either makes use of FIFO or not.

picture by removing some explanatory variables that are either insignificant or highly correlated with others and to identify a model in which most of the variables have significant coefficients.

The model's performance has been evaluated using the likelihood ratio index as a measure of "goodness of fit" (Judge et al., 1988)[127]. The log–likelihood is the log of the likelihood of the probabilities of adopting SLD and/or FIFO by each of the companies in the sample. Since the likelihood is a small number that is less than 1, it is customary to use the minus twice log likelihood *(–2 LL)* as a measure of how well the estimated model fits the data. A good model is one that results in a high likelihood of the observed results. This translates to a small value for *–2LL*[128]. Given that log–likelihood is negative, the *–2LL* is positive, and thus larger values indicate a worse prediction of the dependent variable. The chi–square values for each model test the null hypothesis that the coefficients for all of the terms in the model, except the constant, are zero[129]. Within the incremental tests, the change in the *–2LL* which corresponds to each step in the selection procedure is referred as the improvement chi-square.

A combined test of the model coefficients was performed using the improvement

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[127] The likehood ratio index (LRI) provides a measure of goodness of fit and is calculated as follows:
$LRI = 1 - [L(\Omega) / L(\omega)]$
where:
$L(\Omega)$ = the value of the log likelihood function evaluated at the maximum likelihood estimates.
$L(\omega)$ = the maximum value of the log likelihood function under the hypothesis that $\beta_1 = \text{------} = \beta_k = 0$

[128] For example, if a model fits perfectly, the likelihood is 1 and *–2LL* is 0.0.

[129] *"Model chi-square"* $G_M$ is a likelihood ratio test which reflects the difference between error not knowing the independents (initial chi-square) and error when the independents are included in the model (deviance). Thus, $G_M$ = initial chi-square ($D_0$) – deviance ($D_M$). Model chi-square follows a chi-square distribution (unlike deviance) with degrees of freedom equal to the difference in the number of parameters in the examined model compared to the model with only the intercept. However, *"Block chi-square"* is a likelihood ratio test also printed by SPSS, representing the change in model chi-square due to entering a block of variables.

in the log–likelihood[130]. The ability of the fitted model to predict the choice of method from the independent variables was measured by the percentage correctly identified by the fitted model[131]. The significance of the individual parameter estimates for the independent variables was assessed by treating the ratio of parameter estimate to its standard error as a standard normal deviate[132]. For the regression coefficients, the p–value shown is the probability of a standard normal deviate taking a value further than the observed ratio in the direction predicted by the alternative hypothesis. This process takes account of the predicted sign of the coefficient.

Regarding to the level of significance, it is customary in the social sciences research to set the level of significance at 0.05. In this study, the hypotheses were evaluated at the 0.05 level of significant.

## 5.8 Summary and closing remarks

This chapter presented the research plan employed in this study. The first part referred to the research design being employed. The data–collection methods used consist of a questionnaire survey and the analysis of a database. The sample of the questionnaire survey consists of the 320 largest firms (classified by the working capital in financial year 2001) operating in the Cairo area, the Alexandria Governorate and the Menoufia Governorate in Egypt. The sample of the database includes the 96 most

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[130] The omnibus test of model coefficients compares the fit of the model in question with that of the first model, with a single parameter. Large values of this statistic indicate a significant improvement in fit.

[131] The overall percentage correct compares the observed frequencies with the fitted group frequencies, using a cut–off point to assign an observation to a group [0 or 1] depending on its estimated probability of group membership.

[132] SPSS provides the Wald statistic for this purpose, which is the square of the ratio of parameter estimate to its standard error. The Wald statistic is not appropriate when the alternative hypothesis is one–sided, as it destroys the information on the sign of the parameter estimate.

traded companies listed in CSE for which information were available. The types of variables employed include independent, dependent and control variables. Measurement of the variables employed in the questionnaire survey has involved nominal, ordinal and ratio scales. Parametric and non–parametric tests have been used for analysing the data collected by the questionnaire survey and the database analysis. The questionnaire was the subject of a pilot–study and a pilot testing. On the basis of the findings of the pilot study, modifications were made to the structure of the questionnaire. The utilized statistical tests and level of significance have been discussed.

To conclude this chapter, a positivistic hypothetico–deductive approach has been adopted by deriving the hypotheses from the literature (PAT). Primary and secondary sources of data are then used to test these hypotheses: a questionnaire survey and a database. As recommended during the pilot study, the questionnaire was distributed via fax and personal contact for at least a proportion of the sample to deal with the issue of the low response rate.

# Chapter 6: Data Analysis and Empirical Findings

## – Descriptive Statistics –

## 6.1 Introduction

Descriptive statistics summarising (i) the responses to the questionnaire survey, (ii) the characteristics of the main variables in the database and (iii) the association between certain of the variables are presented in the current chapter. The results of statistical tests of the hypotheses that were formulated in Chapter 4 will be presented in Chapter 7.

The present chapter is organised into four sections. Section 6.2 contains descriptive statistics for the responses to the questionnaire survey and for the association between certain responses. Section 6.3 presents descriptive statistics for the variables that are included in database and for the association between certain pairs of these variables. In section 6.4, the summaries in section 6.2 (questionnaire survey) and section 6.3 (database) are compared.

## 6.2 Questionnaire survey

A full description of the target population, the sample selection, the pilot testing and the amending of the questionnaire and its distribution was provided in Chapter 5. In brief, the target population for the survey consisted of the 320 largest firms (classified by working capital in financial year 2001) in the three most industrialised areas in Egypt: the Cairo area, the Alexandria Governorate and the Menoufia Governorate. These areas were chosen because most of the large firms in Egypt are concentrated in this location. Data from the Egyptian Business & Finance Portal web and interviews with the chairmen of the investors associations in five industrial cities were used to determine the 320 largest firms which comprise the sample for the study. Practical considerations contributed to the sample selection procedure. The questionnaires were

distributed and collected through fax, by mail and in person. The personal distribution of the questionnaires was used when permitted by the geographical proximity of the target–sample. Almost half of the questionnaires were collected by fax. In the case of the questionnaires collected through fax and by mail, potential respondents were contacted initially by telephone calls to prepare them for forthcoming document.

Out of the 320 questionnaires, 93 were returned completed and usable: the response rate therefore is 29%. Some of the returned questionnaires were only partially completed but were usable with regard to most questions. Thus the sample size for responses to individual questions varies with a maximum of 93. The sectoral distribution of the responding firms classified according to distribution method employed is presented in Table 6-1. This table also includes the distribution of the 320 firms in the target population for each industry and the response rate on an individual sector basis. An analysis of the table reveals that response rates vary from a low of 16.0% for the "Building materials" sector to a high of 100% for the "IT and communications" industry. It is worth pointing and, however, that there were only 3 companies in this latter sector – all off them returned their completed questionnaire.

**Table 6-1 Sectoral distribution of the respondent firms**

| Industry | Personal distribution | | Fax distribution | | Mail distribution | | Total responses | | Sample | | Response rate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % | Number | % | |
| Textile | 12 | 40 | 8 | 18 | - | - | 20 | 21.5 | 43 | 13.4 | 46.5 |
| Food and beverages | 3 | 10 | 5 | 11 | 1 | 5 | 9 | 9.7 | 35 | 10.9 | 25.7 |
| Steel | - | - | 3 | 7 | - | - | 3 | 3.2 | 6 | 1.9 | 50.0 |
| Chemical production | - | - | 5 | 11 | 3 | 16 | 8 | 8.6 | 34 | 10.6 | 23.5 |
| Construction and housing real estate | 3 | 10 | 3 | 7 | 1 | 5 | 7 | 7.5 | 29 | 9.1 | 24.1 |
| Building materials | 2 | 7 | 1 | 2 | 1 | 5 | 4 | 4.3 | 25 | 7.8 | 16.0 |
| Hotels and tourism | - | - | - | - | 3 | 16 | 3 | 3.2 | 16 | 5.0 | 18.8 |
| Electrical appliances | 3 | 10 | 3 | 7 | - | - | 6 | 6.5 | 19 | 5.9 | 31.6 |
| Wood and paper | 2 | 7 | 3 | 7 | - | - | 5 | 5.4 | 22 | 6.9 | 22.7 |
| IT and communications | 1 | 3 | 2 | 5 | - | - | 3 | 3.2 | 3 | 0.9 | 100.0 |
| Pharmaceuticals and medical | 3 | 10 | 7 | 16 | 1 | 5 | 11 | 11.8 | 36 | 11.3 | 30.6 |
| Other | 1 | 3 | 4 | 9 | 9 | 47 | 14 | 15.1 | 52 | 16.3 | 26.9 |
| Total | 30 | 100 | 44 | 100 | 19 | 100 | 93 | 100 | 320 | 100.0 | 29.1 |

Note: this table outlines the response rate by industry for each of the three distribution approaches adopted in the questionnaire survey: personal distribution, fax and mail.

### 6.2.1 A test of non-response bias

Bias is the difference between a survey estimate and the actual population value. The presence of non-response bias, if it exists, suggests that the viewpoints of non-respondents are significantly different from those of respondents (Wallace and Mellor, 1988). Non–response bias is associated with (i) an estimate of the amount of non–response and (ii) the difference in the estimate between the respondents and non–respondents. Bias is associated with both low response rates and strong differences in the estimates between respondents and non–respondents. Non–response bias analyses serve as an indicator of the quality of the data collected and help identify potentially biased estimates.

The non-response analysis for the questionnaire survey in the current study was conducted on the basis of (i) the sectoral characteristics of the respondent firms and (ii) the comparison of "early" with "late" respondents. Firstly, the sectoral distribution of the respondent firms was compared with the corresponding distribution for the target population. In order to confirm that the sample is representative of the population, a chi–squared test of the null hypothesis that the proportion of responses in each sector is constant was carried out. This test resulted in a chi–squared goodness of fit statistic of 12.17 on 10 degrees of freedom, with a p–value[133] of 0.0.274 and hence the null hypothesis cannot be rejected at the 5% level. This means that concerns regarding non–response bias on any inferences from the sample to the population may not be serious.

Secondly, the probability of non-response bias was investigated using the idea that later respondents to a survey are more similar to non-respondents than are earlier

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[133] When all 12 sectors were employed the test resulted in a chi–squared goodness of fit statistic of 19.521 on 11 degrees of freedom, with a p–value of 0.052. However one cell had an expected frequency of less than 1, rendering this chi-squared approximation invalid. Consequently, the offending sector "IT and communications" was combined with "Other" for the purposes of this test.

respondents (Wallace and Mellor, 1988). Thus, the responses to the questionnaire were divided into two groups: those questionnaires which were collected in the first three weeks after distributing the questionnaire documents were placed in the first group while the remaining questionnaires were included in the second group[134].

The first group consisted of 48 respondents while the second group was consisted of 45 respondents. Based on the two groups, Mann-Whitney U-tests[135] were applied to those variables that were measured on the ordinal scale; for those questions based on a categorical scale, a chi-squared test was performed (see Table 6-2). This finding led to the conclusion that the viewpoints of non-respondents were probably not significantly different from those of respondents; only two variables[136] are significance with the two sets of responses. It is therefore, not unreasonable to assume that the results of the first group in the sample are similar to those in the second group.

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[134] In this case, the questionnaire documents which were received before or on 15/08/2002 were placed in the first group; since the questionnaire documents were faxed or posted in 24-25 July 2002, these respondents took less than three weeks to answer the questionnaire. In Egypt the post takes 3 days to be delivered.

[135] The Mann-Whitney U-test is used when one variable of interest at least is measured in ordinal scale, and the two random samples are independent.

[136] The test results indicated that there was no difference at the 5% level of significance between the two sets of responses based on 40 out of 42 variables. The two variables are "depreciation method" and "depreciation rate of buildings".

**Table 6-2 Test of non-response bias**

| | Variables | Type of test | p-value |
|---|---|---|---|
| 1. | Industry group | Ch-square | 0.106 |
| 2. | Quoting on the CSE | Ch-square | 0.642 |
| 3. | Current market prices | U-test | 0.544 |
| 4. | Ownership status | Ch-square | 0.189 |
| 5. | Total value of sales | U-test | 0.283 |
| 6. | Total value of the total assets | U-test | 0.272 |
| 7. | Existence of bonus schemes | Ch-square | 0.073 |
| 8. | The basis of bonus | U-test | 0.234 |
| 9. | Percentage of bonus | U-test | 0.989 |
| 10. | Trend of percentage of bonus | U-test | 0.634 |
| 11. | Total assets to debt | U-test | 0.337 |
| 12. | Rate of tax | U-test | 0.844 |
| 13. | Depreciation method | Ch-square | 0.016 |
| 14. | Inventory valuation method | Ch-square | 0.491 |
| 15. | Industry norm and the depreciation method | U-test | 0.555 |
| 16. | Class of asset and the depreciation method | U-test | 0.438 |
| 17. | Simplicity of calculation and the depreciation method | U-test | 0.057 |
| 18. | Net income and the depreciation method | U-test | 0.801 |
| 19. | Cash flows and the depreciation method | U-test | 0.210 |
| 20. | Depreciation rate of buildings | U-test | 0.001 |
| 21. | Depreciation rate of plant and machinery | U-test | 0.057 |
| 22. | Depreciation rate of vehicles | U-test | 0.643 |
| 23. | Depreciation rate of computers and office equipment | U-test | 0.472 |
| 24. | Depreciation rate of furniture | U-test | 0.286 |
| 25. | Basis of depreciation rate of buildings | U-test | 0.140 |
| 26. | Basis of depreciation rate of plant and machinery | U-test | 0.180 |
| 27. | Basis of depreciation rate of vehicles | U-test | 0.536 |
| 28. | Basis of depreciation rate of computers and office equipment | U-test | 0.686 |
| 29. | Basis of depreciation rate of furniture | U-test | 0.312 |
| 30. | Change in depreciation method for buildings | U-test | 0.652 |
| 31. | Change in depreciation method for plant and machinery | U-test | 0.404 |
| 32. | Change in depreciation method for vehicles | U-test | 0.720 |
| 33. | Change in depreciation method for computers and office equipment | U-test | 0.432 |
| 34. | Change in depreciation method for furniture | U-test | 0.701 |
| 35. | Industry norm and the inventory method | U-test | 0.715 |
| 36. | Current price and the inventory method | U-test | 0.390 |
| 37. | Simplicity of calculation and the inventory method | U-test | 0.131 |
| 38. | Tax charges and the inventory method | U-test | 0.438 |
| 39. | Net income and the inventory method | U-test | 0.925 |
| 40. | Change in inventory method for raw material | U-test | 0.052 |
| 41. | Change in inventory method for work in progress | U-test | 0.155 |
| 42. | Change in inventory method for final product | U-test | 0.169 |

### 6.2.2 Independent variables

The independent variables identified in Chapters 4 and 5 were: the existence of a management bonus plan (MP), leverage characteristics (LEV) and size (SIZE). The hypotheses developed for the current study were put in the form of all firms, owner-controlled firms and manager-controlled firms. Thus, one can assume that it is important to present the descriptive statistical of ownership/control structure for the respondent firms and then present the descriptive statistics for each independent variable. The descriptive statistics are presented in the following sub-sections; in some cases these statistics are broken down by different categories of other variables.

#### *6.2.2.1 Ownership structure and Bonus scheme*

Following the pattern established in many previous empirical studies,[137] this investigation used dichotomous variables to classify firms by ownership/control type as either owner–controlled or manager–controlled[138]. Table 6-3 presents details of descriptive statistics for the ownership structure of the firms responding to the questionnaire (Question 5). For example, the current study uses two different categories of control in the analysis. Specifically, measures of concentration are employed to identify the "Owner controlled" group: i.e. respondents in category (A) of Table 6-3 which refers to firms where one shareholder or one related group (for example a family) owns 10% or more of the total share capital were categorised as owner–controlled; all other firms were combined into a "Manager controlled" group. However, respondents from 15 of the 93 firms indicated that the ownership status of their firms

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[137] See for example Kamin and Ronen, 1978; Dhaliwal et al, 1982; Amihud, et al., 1983; Dempsey et al. 1993; Short, 1994.

spanned two or more of the options offered in question 5 of the questionnaire survey, resulting in a total of 108 answers.

**Table 6-3 Descriptive statistics for the ownership structure of firms in the survey (Question 5)**

| Type of ownership | | Number of firms | % |
|---|---|---|---|
| A | One shareholder or one related group (for example a family) owns 10% or more of the total share capital. | 60 | 55.5 |
| B | A bank or an insurance company owns 20% or more of the total share capital. | 7 | 6.5 |
| C | One group of up to five shareholders (either physical persons or legal entities), who are not members of the same family own 10% or more of the total share capital. | 28 | 25.9 |
| D | Privatised company and the government still own 50% or more of the total share capital. | 1 | 0.9 |
| E | Privatised company and the government still owns less than 50% of the total share capital | 12 | 11.1 |
| Total | | 108 | 100.0 |

Category (C) of Table 6-3 includes 14 firms which are also in category (A); these firms were therefore removed from the manager–controlled group. Similarly one firm was removed from category (E). This adjustment leads to the classification shown in panel A of Table 6-4 in which each firm appears exactly once. The descriptive statistics regarding the type of ownership/control of the respondent firms shows that the ownership of the majority (65%) of respondent firms in the survey is concentrated in the hands of few owners. One could therefore anticipate that in these 60 companies the major owners of the firm would tend to exercise active control over their companies' affairs.

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[138] More recent studies use of continuous classification. However, in Egypt the ownership required to call shareholders meeting is 5% for ordinary meetings and 10% for extraordinary meetings. Which suggest that the dichotomous classification is more appropriate.

The 60 owner–controlled firms can be further divided into Family and Non–Family controlled firms. Category (A) of table 6-3 includes 14 firms, which are also in category (C); these firms fall in the non–family controlled category. The classification shown in panel B of Table 6-4 indicates that the majority of the respondents in owner–controlled companies (77%) were working for firms with highly concentrated family ownership.

**Table 6-4 Type of control for the firms in the survey**

| **Panel A: Control of firms** | | | **Panel B: Distribution of the owner–controlled firms** | | |
|---|---|---|---|---|---|
| Type of control | Number of firms | % | Owner–controlled | Number of firms | % |
| Owner | 60 | 65 | Family controlled | 46 | 77 |
| Management | 33 | 35 | Non– Family controlled | 14 | 23 |
| Total | 93 | 100 | Total | 60 | 100 |

Evidence from earlier studies (e.g., Amihud et al., 1983; Dempsey et al., 1993; Short, 1994) suggests that there is a link between managerial compensation schemes and ownership/control structure; i.e. that manager–controlled firms are more likely than owner–controlled firms to have incentive compensation plans. Such plans are thought to reflect the outside owners' need to motivate managers to act in a manner consistent with owners' interests; in Egypt, these plans usually rely on linking compensation with reported earnings. As discussed in Chapter 4, however, in Egypt, owner-controlled firms may employ bonus plans if the large owners are not involved in the management and if they employ professional individuals to represent them and manage the firms. In such case, it is hypothesised that the executives of owner–controlled firms may be motivated to increase the reported earnings not only to maximise their personal benefits, but also to influence their reputation and increase the satisfaction of their employers.

Table 6-5 indicates that a considerable proportion (about 54%) of the respondent firms employ bonus schemes. Furthermore, cross–tabulation of control type against use of a bonus scheme in Table 6-5 suggests that bonus schemes are more likely to be used in the case of manager–controlled firms. The proportion of manager–controlled firms that employ bonus schemes (91%) is much higher than in the case of owner–controlled firms (33%). The observed results reported in Table 6-5 clearly suggest that there is a strong positive association between the firm's type of ownership/control and the employment of a bonus scheme, (Kendall's tau–b = 0.553). Because of the influence of bonus schemes on manager's motivation, this result is consistent with the prediction that manager–controlled firms are more likely to adopt income increasing accounting methods and with the evidence reported in the literature[139].

**Table 6-5 Control and usage of bonus schemes of firms in the survey**

| Management bonus schemes | Owner–controlled | | Manager–controlled | | All firms | |
|---|---|---|---|---|---|---|
| | Number of firms | % | Number of firms | % | Number of firms | % |
| No bonus scheme | 40 | 66.7 | 3 | 9.1 | 43 | 46.2 |
| Bonus scheme | 20 | 33.3 | 30 | 90.9 | 50 | 53.8 |
| Total | 60 | 100.0 | 33 | 100.0 | 93 | 100.0 |

Table 6-6 shows that 86% of the 50 firms that employ bonus schemes base their bonus on net income after tax, while 8% of these firms use net income before tax. In the remaining 3 firms, the bonus payment is not related to income; one of the firms reported that the level of bonus payment for their company was determined by the total sales, while the other two firms stated that a fixed bonus was paid upon the attainment of a specific target.

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[139] See for example, Dhaliwal et al. (1982), Lewellen et al. (1987) and Dempsey et al. (1993).

**Table 6-6 Type of bonus schemes employed by firms in the survey**

| Bonus–payment basis | Net income before tax | Net income after tax | Other | Total |
|---|---|---|---|---|
| Number of firms | 4 | 43 | 3 | 50 |
| % | 8 | 86 | 6 | 100 |

In the questionnaire survey, only 42 out of 50 participant firms that employ management bonus schemes revealed[140] how, in the last reported year, the bonus paid to the chief executive officer was compared to his/her basic salary (see Table 6-7). Almost half of the participant firms (43%) stated that the bonus paid was larger than the basic salary. Overall, the median ratio of bonus to salary of participant firms in the survey lies in the interval 0.75 to 1.0, with a mean probably around 0.8[141]. This estimated mean bonus to salary ratio is large in comparison with the findings of other researchers. For example, a ratio of 0.317 was documented for US companies in Bowen et al. (2002). Ratios of 0.13 for Australia, 0.21 for the USA, 0.15 for the UK and 0.23 for New Zealand were reported in Coulton et al. (2002). Finally, a figure of 0.592 was highlighted in Bauwhede et al. (2003).

At first sight, it appears that the relatively high proportion of bonus to salary ratios for managers of Egyptian firms may offer them an unusually large incentive to adopt income–increasing accounting methods. However, these ratios may be due in part to the smaller size of the firms in the present survey, compared to those analysed in the other surveys cited, and in part to the absence of share options from the typical remuneration package of managers in Egyptian companies. Remuneration packages in other countries also involve sizeable stock option elements which are not included in

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[140] This information was sought in question number 10.

the bonus figures examined in academic studies (Murphy, 1999) and which possibly undertake the incentive–based component of total pay.

**Table 6-7 The proportion of the bonus to salary of firms in the survey**

| The proportion of the bonus to salary | Owner–controlled | | Manager–controlled | | All firms | |
|---|---|---|---|---|---|---|
| | Number of firms | % | Number of firms | % | Number of firms | % |
| 0-25 (%) | 5 | 11.9 | 1 | 2.4 | 6 | 14.3 |
| 25-50 (%) | 3 | 7.1 | 6 | 14.3 | 9 | 21.4 |
| >50-75 (%) | 2 | 4.8 | 2 | 4.8 | 4 | 9.5 |
| >75-100 (%) | 1 | 2.4 | 4 | 9.5 | 5 | 11.9 |
| Over 100% | 7 | 16.7 | 11 | 26.2 | 18 | 42.9 |
| Total | 18 | 42.9 | 24 | 57.1 | 42 | 100.0 |
| Median for all firms = 4 (between 0.75 and 1.0) | | | | | | |

Scale coded 1-5: 1 = 0-25 (%), 2 = 25-50 (%), 3 = 50-75 (%), 4 = 75-100 (%) and 5 = 0ver 100%

Question number 3 in the questionnaire survey asks whether or not a firm is quoted on the stock exchange. All 93 participant firms answered this question, revealing that only 56 (60%) of them are quoted on the ESE. Moreover 31 firms out of 60 owner–controlled firms are quoted on the exchange and 25 of the 33 the manager–controlled firms are quoted on the exchange. That means that manager–controlled firms in the questionnaire survey are more likely to be quoted on the exchange (see Table 6-8). A statistical test of homogeneity of proportions identifies a significant difference between the type of control exercised in quoted and unquoted firms (p–value = 0.021). This is interesting given that equity is more likely to be widely held in firms quoted on the exchange, and may partially explain the relatively high use of bonus schemes in such firms.

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[141] In order to calculate a mean, it is necessary to make arbitrary assumptions as to how the data is spread within the class intervals specified in the table. In particular the choice of value/s to represent the "Over 100%" interval can have a considerable effect on the estimated mean.

**Table 6-8 Firms quoted on the stock exchange by type of control**

| Firms quoted on the exchange | Owner–controlled | | Manager–controlled | | All firms | |
|---|---|---|---|---|---|---|
| | Number of firms | % | Number of firms | % | Number of firms | % |
| Not quoted | 29 | 48.3 | 8 | 24.2 | 37 | 39.8 |
| Quoted | 31 | 51.7 | 25 | 75.8 | 56 | 60.2 |
| Total | 60 | 100.0 | 33 | 100.0 | 93 | 100.0 |
| p–value = 0.021 | | | | | | |

**Table 6-9 Firms quoted on the exchange by bonus schemes**

| Firms quoted on the exchange | No bonus scheme | | Bonus scheme | | All firms | |
|---|---|---|---|---|---|---|
| | Number of firms | % | Number of firms | % | Number of firms | % |
| Not quoted | 23 | 53.5 | 14 | 28.0 | 37 | 39.8 |
| Quoted | 20 | 46.5 | 36 | 72.0 | 56 | 60.2 |
| Total | 43 | 100.0 | 50 | 100.0 | 93 | 100.0 |
| p–value = 0.012 | | | | | | |

Table 6-9 highlighted that 36 out of the 56 firms quoted on the exchange (64%) employ management bonus plans compared with 14 firms out of the 37 firms not quoted on the exchange (38%). The stronger tendency for quoted firms than for unquoted firms to employ management bonus schemes firms is statistically significant (p–value = 0.012). In section 6.3, this finding will be shown to be consistent with information from the database in which all of the firms studied are quoted on the ESE.

### *6.2.2.2 Leverage characteristics*

A firm's leverage characteristics have been identified as a factor that can give rise to the decision to adopt an income increasing accounting method (see, Chapter 5). In the questionnaire survey, the ratio of total debt to total assets was used as a proxy for leverage. Table 6-10 presents descriptive statistics regarding the total debt to total asset ratios of the firms participating in the questionnaire survey. Table 6-10 indicates that

the typical total debt to total asset ratios for 57 out of 93 firms are less than 40.0%. The mean total debt to total asset ratio of the participant firms at 0.37 is lower than the figure in preceding studies: for example the mean total debt to total asset ratios was 0.416 in Rajgopal and Pincus (2000) for American oil and gas firms, 0.523 in Peasnell et al. (2000) for a sample of British companies and 0.70 in Jung and Kwon (2002) for a collection of Korean firms[142].

**Table 6-10 Debt/total asset ratio of firms in the survey[143]**

| Debt / total asset ratio | <20% | 20-40(%) | >40-60(%) | >60-80(%) | >80% | Total |
|---|---|---|---|---|---|---|
| Number of firms | 26 | 31 | 20 | 9 | 7 | 93 |
| % | 28 | 33.3 | 21.5 | 9.7 | 7.5 | 100 |
| Median = 2 (between 0.20 and 0.40), mean estimated at 37% | | | | | | |

Scale coded 1-5: 1 = <20%, 2 = 20-40(%), 3 = >40-60(%), 4 = >60-80(%) and 5 = >80%

### *6.2.2.3 Size variable*

In some circumstances, size may be regarded as a proxy variable for political visibility (see Chapter 5). Size is hypothesised as providing an input to the decision about whether or not to use income–decreasing accounting methods (see H3); larger firms are more in the public eye, and thus, more exposed to political costs. One explanation is that very large firms seek to choose accounting practices that reduce the probability of reporting large earnings in order to avoid unwanted political attention (increased regulation and/or higher taxation levels). Based on this view, large firms

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[142] Rutterford (1985) highlighted the differences in companies' gearing ratios across countries (the US, the UK, Germany and Japan). Specifically, she highlighted how different definitions of gearing yield various results depending upon (i) the data source, (ii) the time period and (iii) the country being investigated. For example, she pointed out that with relatively less developed equity markets in Germany and France debt is the primary source of finance; gearing ratios are higher as a result. Also, the norm in Japan is for companies to finance their activities such that gearing ratios of 80% or more are not atypical.

[143] Question 12 sought information regarding the ratio of total debt to total assets.

would be more likely to choose income–decreasing methods than would their smaller sized counterparts. The size of the firms in the questionnaire survey was measured in three ways: namely, the current capital market value (SIZE1), the total value of sales (SALES) and the latest balance sheet value reported for total assets (ASSETS). The frequency distributions of these sizes as reported by the respondents are presented in Table 6-11.

Unfortunately, as panel A of Table 6-11 highlights, only 61% of respondents divulged the current capital market value of their firm (SIZE1), whereas there were no missing values for either the total value of sales or total assets. Consequently, the current capital market value has not been used as a measure of firm size in the analyses that follow.

**Table 6-11 Summary of size of firms in the survey**

| **Panel A: SIZE1** | | | **Panel B: SALES** | | | **Panel C: ASSETS** | | |
|---|---|---|---|---|---|---|---|---|
| Million L.E. | # firms | % | Million L.E. | # firms | % | Million L.E. | # firms | % |
| <50 | 8 | 8.6 | <10 | 8 | 8.6 | <50 | 10 | 10.8 |
| >50-100 | 12 | 12.9 | 10-25 | 11 | 11.8 | 50-100 | 27 | 29.0 |
| >100-250 | 13 | 14.0 | >25-50 | 10 | 10.8 | >100-250 | 24 | 25.8 |
| >250 –500 | 14 | 15.1 | >50-100 | 18 | 19.4 | >250 –500 | 16 | 17.2 |
| >500 | 10 | 10.8 | >100 | 46 | 49.5 | >500 | 16 | 17.2 |
| Total | 57 | 61.3 | Total | 93 | 100.0 | Total | 93 | 100.0 |
| Missing | 36 | 38.7 | Missing | 0 | 0.0 | Missing | 0 | 0.0 |
| Total | 93 | 100.0 | Total | 93 | 100.0 | Total | 93 | 100.0 |

Information on these aspects of size was sought in questions 4, 6 and 7.
Egyptian million pound, current rate 1 L.E. = 0.19 US$

The total value of sales (SALES), and last reported balance sheet value of the total assets (ASSETS) have both been used to measure SIZE and act as a proxy for political costs. An analysis of Table 6-11 reveals that a wide variety of differently sized companies responded to the questionnaire. There is at least one company in each of the

size categories. However, the spread of companies varies according to whether size is measured by market value, total sales and total assets. For example, 29 companies have sales of under LE 50m while only 10 companies have total assets and 8 companies have market value in the same category.

The relationship between the total values of sales (SALES) and whether firms are quoted on the exchange (questions 3 and 6) as well as the relationship between the total assets (ASSETS) and listing status (questions 3 and 7) are summarised in Table 6-12. The SALES of all 93 companies were ranked[144], and the ranks of the companies quoted on the stock exchange were averaged separately from the ranks of the unquoted companies. The mean rank of the quoted companies, 54.7, is markedly higher than that for the unquoted companies, 35.4. Indeed the difference in mean ranks is statistically highly significant (p–value = 0.0001). Similarly, with regard to ASSETS, the companies quoted on the stock exchange have a markedly higher mean rank of 52.5 compared to the 38.7 for the unquoted companies. Again the difference is statistically significant (p–value = 0.007). Both analyses provide evidence to support the conjecture that in Egypt, larger firms are more likely to be quoted on the stock exchange than their smaller sized counterparts[145].

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[144] The smallest company was ranked 1, and the largest 93. Of course there are many ties in the ranking of likert scale data like this.

[145] This finding is consistent with data collected from the database for firms quoted on the ESE which is reported in section 6.3.

**Table 6-12 An analysis of size and quoting status**

| **Panel A: SALES and quoting status** | | | | |
|---|---|---|---|---|
| Firms quoted on the exchange | Mean rank | U–statistic | Z–score | 1–tailed P |
| Not quoted | 35.4 | 605.5 | -3.63 | 0.0001 |
| Quoted | 54.7 | | | |
| **Panel B: ASSETS and quoting status** | | | | |
| Firms quoted on the exchange | Mean rank | U–statistic | Z–score | 1–tailed P |
| Not quoted | 38.7 | 730.5 | -2.46 | 0.007 |
| Quoted | 52.5 | | | |

Since TAXRATE is included as a control variable in the current study (see Chapter 5), data on this measure is collected in the questionnaire; question 13 in the questionnaire survey is concerned with the taxation rate. Table 6-13 presents the percentage of tax which respondent firms expect to pay on the net income. An analysis of Table 6-13 reveals that 16.1% of firms expect to be tax exempted while 20.4% of firms only anticipate paying up to 10% of their profits in tax just were one fifth of firms responding to the questionnaire expect to face an effect tax rate of 30%.

**Table 6-13 Percentage of tax expect to pay on net income for the survey firms**

| Taxation rate | 0% | 1-10 (%) | >10-20 (%) | >20-30 (%) | >30% | Total |
|---|---|---|---|---|---|---|
| Number of firms | 15 | 19 | 25 | 15 | 19 | 93 |
| % | 16.1 | 20.4 | 26.9 | 16.1 | 20.4 | 100 |

Descriptive statistics for each independent variable have been presented in previous paragraphs. The correlations between pairs of these independent variables are shown in Table 6-14. The table shows a significant positive correlation for respondent firms between the use of management bonus schemes (MP) and each of the size variables and the tax rate: total sales of respondent firms (SALES), total value of assets (ASSETS) and TAXRATE had correlations of 0.311, 0.236 and 0.391 respectively.

These correlations suggest that larger companies are more likely to employ bonus plans (as is expected in any environment). A significant positive correlation of 0.223 also exists between the ASSETS and the debt/total assets ratios (LEV). This could be interpreted as meaning that size has a positive influence on leverage and growth and that large firms have better access to debt, thereby confirming the findings of Charitou and Vafeas (1998). Large firms are likely to have the funds to pursue projects with positive net present values and thereby to make more profits. Table 6-14 shows an extremely high positive correlation of 0.722 between the total sales of firm (SALES) and the total value of assets (ASSETS). In contrast to the prior research, the correlation between size of respondent firms (ASLES and ASSETS) and TAXRATE is not statistical significant.

**Table 6-14 Correlation between the independent variables of firms in the survey (p–values are shown in italics above the diagonal)**

| Variables | MP | LEV | SALES | ASSETS | TAXRATE |
|---|---|---|---|---|---|
| MP | 1 | *0.620* | *0.001* | *0.012* | *0.000* |
| LEV | -0.047 | 1 | *0.173* | *0.009* | *0.113* |
| SALES | 0.311** | 0.119 | 1 | *0.000* | *0.230* |
| ASSETS | 0.236* | 0.223** | 0.722** | 1 | *0.897* |
| TAXRATE | 0.391** | -0.135 | 0.103 | -0.011 | 1 |

*Correlation is significant at the level 0.05 and **correlation is significant at the level 0.01. MP was coded as one (1) if firm has Management compensation plans, and zero (0) if not; LEV referred to total debt divided by total assets; SALES referred to total sales; coded 1-5 (see table 6-11, panel B); ASSETS referred to total assets; coded 1-5 (see table 6-11, panel C) and TAXRATE referred to rate of tax coded 1-5 (see table 6-13).

### 6.2.3 Accounting choice (dependent) variables

The depreciation and inventory valuation policy methods of the firms were identified as the dependent variables (see Chapter 5). Specifically, the dependent

variables refer to whether a firm uses SLD or some other depreciation method, and to whether a firm uses FIFO or some other inventory valuation method.

With regard to the depreciation policy decision, Table 6-15 presents a summary of the responses from firms regarding the type of depreciation they employ for each of 8 classes of asset, and in particular whether or not the firm uses SLD. Most of the respondent firms use the same depreciation method for all classes of asset[146]. Only two firms have a different depreciation method for computers and office equipment, so the depreciation method used for the fixed tangible depreciable assets (e.g., plant, machinery) has been used to identify the firm's depreciation method for the purpose of further analyses. Table 6-15 also shows that 74 firms out of 93 (79.6%) choose the SLD method; an income–increasing choice.

**Table 6-15 Responses to depreciation method of firms in the survey (Question 14)**

| | Number of firms | | | % |
|---|---|---|---|---|
| | Does not use SLD | Uses SLD | Total | |
| Buildings. | 19 | 74 | 93 | 79.6 |
| Plant and machinery. | 19 | 74 | 93 | 79.6 |
| Vehicles. | 19 | 74 | 93 | 79.6 |
| Computers and office equipment | 16 | 76 | 92 | 82.6 |
| Furniture. | 19 | 74 | 93 | 79.6 |
| Intangible asset e.g. patents. | 10 | 27 | 37 | 73.0 |
| Research and development. | 15 | 29 | 44 | 65.9 |
| Goodwill. | 9 | 26 | 35 | 74.3 |
| Other. | 1 | 7 | 8 | 87.5 |
| Total respondent firms. | 19 | 74 | 93 | 79.6 |

[146] Responses regarding type of depreciation about the last 3 classes of assets (intangible asset e.g. patents, research and development as well as goodwill) have a lot of missing, thus, only the first 5 classes of assets were used to determine the type of depreciation that is used in the analysis.

**Table 6-16 Factors affecting choice of depreciation method of firms (Question 15)**

| | N | Mean | Std. Dev. | Median |
|---|---|---|---|---|
| Industry norm | 90 | 4.18 | 1.16 | 5 |
| Suitability for class of asset | 93 | 4.54 | 0.75 | 5 |
| Simplicity of calculation | 90 | 3.02 | 1.32 | 3 |
| Affect on net income | 90 | 2.91 | 1.23 | 3 |
| Affect on cash flow | 88 | 2.63 | 1.25 | 3 |

Scale coded 1-5: 1 = not important at all, 2 = not very important, 3 = neutral, 4 = important and 5 = very important

The descriptive statistics regarding the responses to the factors which may influence the choice of the depreciation method are examined and reported in Table 6-16 (Question 15). The frequency distributions presented in Table 6-16 indicate that two factors stand out as being the most important in determining the depreciation method; the suitability of the depreciation method for the particular class of asset (mean = 4.54) and conforming to the industry norm (mean = 4.18). By contrast, the factors shown as of least importance in determining the depreciation method are the effect on cash flow (mean = 2.63) and the effect on net income (mean = 2.91).

The other dependent variable in the current study is the inventory valuation method. After minor adjustments[147] the classification shown in Table 6-17 is obtained. Table 6-17 indicates that on average 40 firms out of 93 respondent firms choose FIFO (43%); an income–increasing choice. This mean value masks a spread of responses which range from a low of 34.8% for raw material to a high of 45.6% for work in progress.

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[147] Responses to question 20 show that six firms from the questionnaire survey do not use FIFO for the inventory of the raw material but use FIFO for the inventory of the work in progress and final products; these firms were categorised as "Use FIFO". In addition, there are three firms that did not answer the question concerning the method of valuation for the inventory of the raw material but indicated that they use FIFO for the other types of inventory, those firms also were categorized as "Uses FIFO".

**Table 6-17 Responses to inventory valuation method of firms in the survey (Question 20)**

| | Number of firms | | | |
|---|---|---|---|---|
| | Does not use FIFO | Uses FIFO | Total | % |
| Raw material | 58 | 31 | 89 | 34.8 |
| Work in progress | 43 | 36 | 79 | 45.6 |
| Final product | 52 | 38 | 90 | 42.2 |
| Other | 0 | 0 | 0 | 0 |
| Total respondent firms | 53 | 40 | 93 | 43.0 |

**Table 6-18 Factors affecting choice of the inventory method of firms (Question 21)**

| | N | Mean | Std. Dev. | Median |
|---|---|---|---|---|
| Industry norm | 89 | 4.33 | 1.13 | 5 |
| Current market price | 93 | 4.17 | 1.19 | 5 |
| Simplicity of calculation | 89 | 2.9 | 1.28 | 3 |
| Affect on tax amount | 89 | 2.58 | 1.33 | 3 |
| Affect on net income | 89 | 2.96 | 1.40 | 3 |

Scale coded 1-5: 1 = not important at all, 2 = not very important, 3 = neutral, 4 = important and 5 = very important

The descriptive statistics regarding the responses to the factors that may influence the choice of valuation method, are reported in Table 6-18 (Question 21). These statistics identify two factors that are particularly important in determining the choice of inventory valuation method; the industry norm (mean = 4.33) and the current market price of the stock (mean 4.17). However, contrary to expectation, tax is the least important factor in determining the choice of inventory valuation method (mean = 2.58).

Table 6-19 shows the association between the depreciation policy decision and inventory valuation method and indicates that there is a positive relationship between using SLD method and using the FIFO inventory valuation method. Indeed their non–

parametric correlation coefficient Kendall's tau–b of 0.440 is significantly greater than zero (p = 0.000012).

**Table 6-19 Cross–tabulation of depreciation method by inventory valuation method for the survey[148]**

| Depreciation policy | Inventory policy | | Total |
|---|---|---|---|
| | FIFO Income–increasing | NO FIFO Income–decreasing | |
| Uses SLD (Income–increasing) | 40 | 34 | 74 |
| Does not use SLD (Income–decreasing) | - | 19 | 19 |
| Total | 40 | 53 | 93 |
| p–value = 0.000012 | | | |

**Table 6-20 Descriptive statistics for firms in the survey**

| *Descriptive statistics (N=93)* | | | | | |
|---|---|---|---|---|---|
| Variables | Mean | Std. Dev. | Median | Min. | Max. |
| DEP | 0.796 | 0.405 | 1 | 0 | 1 |
| INV | 0.430 | 0.498 | 0 | 0 | 1 |
| MP | 0.538 | 0.501 | 1 | 0 | 1 |
| MC | 0.355 | 0.481 | 0 | 0 | 1 |
| LEV | 2.355 | 1.204 | 2 | 1 | 5 |
| SALES | 3.892 | 1.363 | 4 | 1 | 5 |
| ASSETS | 3.011 | 1.264 | 3 | 1 | 5 |
| TAXRATE | 3.043 | 1.359 | 3 | 1 | 5 |

DEP was coded as one for SLD and zero for otherwise; INV was coded as one for FIFO and zero for otherwise; MP was coded as one if firm has Management compensation plans and zero if not; MC was coded as one if there is no one or group shareholder owning 10% or more of the total shares and zero for otherwise; LEV was total debt divided by total assets coded 1-5 (see Table 6-10); SALES was total sales coded 1-5 (see, panel B of Table 6-11); ASSETS was total assets coded 1-5 (see panel C of Table 6-11) and TAXRATE was rate of tax coded 1-5 (see Table 6-13).

The overall descriptive statistics for participant firms in the questionnaire survey are presented in Table 6-20. For each variable, the mean, standard deviation, median, maximum and minimum values have been reported. Table 6-20 shows that a slight

[148] Alternative combinations of accounting policies and income strategies are presented in Appendix 6-1.

majority of firms (53.8%) employ bonus plan mechanisms according to the questionnaire respondents. The proportion of firms identified as manager–controlled is 0.355, which means that a majority of firms included in the survey have concentrated ownership. The mean size (SALES and ASSETS) for participant firms in the survey is 3.9 and 3.0 respectively. These figures indicate that the sample includes firms that are smaller than those identified in earlier studies.

This concludes the investigation of the descriptive statistics and an examination of the association between certain variables from the responses of the questionnaire survey. In the following section the descriptive statistics and association between certain variables from the collected financial statements (database) are presented.

## 6.3 Financial statements (database)

Data on Egyptian firms quoted on the CSE have been collected manually from the paper documents held by three sources: (i) the CMA in Cairo, (ii) the Disclosure Department at the CSE and (iii) the Kompass Egypt business database. Because a sizeable tax advantage is given to firms that are listed on the exchange (see Chapter 2), a large number of companies have elected to be listed, including some companies that are closely held (i.e. that have relatively few shareholders). As a consequence, the ESE has two types of listed companies: namely (i) actively traded companies; and (ii) rarely and non–traded companies which are mostly closely held. Only the 118 most frequently traded companies are included in the database for the current research study[149]. The annual reports for these companies were collected from the three data sources.

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[149] Only the annual reports for the most traded companied were complete and thus analysed in the thesis.

The first step was to exclude regulated and non–service firms (financial and insurance) which are not particularly likely to hold inventory or to incur significant depreciation costs. The next step was to examine the annual reports of the remaining firms to determine the depreciation method used by each for financial reporting purposes during the years 1999, 2000 and 2001. Any firm that did not report its depreciation method or did not document its inventory valuation method was excluded from the sample. In addition, one firm that changed its inventory valuation method during the period 1999 to 2001 was also omitted in order to obtain a sufficient set of data for a consecutive three–year period[150]. The objective was to obtain a set of firms with complete data for the three–year period to make it possible to estimate the logistic models outlined in Chapter 5. The final sample includes 96 firms. Egyptian firms are able to change their depreciation and inventory valuation policies. It follows that one can assume that existing practices reflect managers' preferences. Therefore one can use consistent accounting practices to test hypotheses relating to managerial behaviour. (In effect, managers have chosen not to adopt alternative accounting practices).

### 6.3.1 Dependent variables

Table 6-21 presents the frequency distribution of accounting policy choices by the 96 firms drawn from the database. Table 6-21 shows that, for the sample firms, the percentage of firms choosing the SLD method is 88.5. This figure is consistent with evidence reported in Hagerman and Zmijewski (1979), Press and Weintrop (1990) and

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[150] Precisely, nineteen non–service firms (financial and insurance) were excluded from the sample, two firms were excluded from the sample because they did not report depreciation method or did not supply details about the inventory valuation method and one firm was excluded because it changed the inventory valuation method within the three–year period.

Gopalakrishnan (1994) which quoted percentages of 85.0, 89.0 and 84.0 respectively. Furthermore, Bowen et al. (2000) found that for 1984, 1995 and 1996 the mean percentage of their sample using SLD were 65.3, 70.1 and 79.3 respectively. By contrast, Dhaliwal (1988) found that the mean SLD was only 0.277. It seems that most traded Egyptian firms have a strong tendency to opt for an income increasing accounting choice when it comes to selecting a depreciation method.

**Table 6-21 Distribution of accounting policy choices of firms in the database**

| | Depreciation[151] | | Inventory | |
|---|---|---|---|---|
| | Number of firms | % | Number of firms | % |
| Income–increasing policy | 85 | 88.5 | 19 | 19.8 |
| Income–decreasing policy | 11 | 11.5 | 77 | 80.2 |
| Total | 96 | 100 | 96 | 100 |

Table 6-21 also presents the frequency distribution of inventory method chosen by the firms in the database. Table 6-21 indicates that, for the sample firms, the percentage of firms choosing FIFO rather than LIFO is 19.8; this percentage compares with 50.0 in Hagerman and Zmijewski (1979), 59.0 in Press and Weintrop (1990) and 85.0 in Gopalakrishnan (1994). Furthermore Bowen et al. (2000) found that for years 1984, 1995 and 1996 the mean percentage of firms choosing FIFO inventory method was 56.9, 68.1 and 70.0 respectively. Thus, it is evident that most traded Egyptian firms are less likely to adopt FIFO than the firms investigated in the previous studies.

The cross–tabulation of depreciation policy decision and the inventory valuation method for the firms in the database is shown in Table 6-22. These results indicate that there is a strong association between the usage of FIFO for inventory valuation and the

usage of SLD for depreciation. Indeed, all nineteen firms that use FIFO for inventory also use SLD for depreciation. The degree of association is statistically significant at the 5% level; the likelihood ratio with one degree of freedom is 5.193 and the p–value is 0.023.

**Table 6-22 Cross–tabulation of depreciation method by inventory method for the database[152]**

| Depreciation policy | Inventory policy | | Total |
|---|---|---|---|
| | FIFO Income–increasing | NO FIFO Income–decreasing | |
| Uses SLD (Income–increasing) | 19 | 66 | 85 |
| Does not use SLD (Income–decreasing) | - | 11 | 11 |
| Total | 19 | 77 | 96 |
| p–value = 0.023 | | | |

### 6.3.2 Independent variables

As the previous sections mentioned, management bonus plans, leverage and size were identified as the independent variables. Data on these variables were therefore gathered. Once again, descriptive statistical of ownership/control structure for the database firms is presented and then present the descriptive statistics for each independent variable. However, this was a relatively difficult task; no electronic databases on the ownership characteristics of Egyptian firms exist; therefore, data on the identity and size of the five largest shareholder holdings in all of the 96 firms was collected by examining the financial statements. Ownership structure for about 70 firms was obtained from Kompass Egypt Financial Yearbook 2001, wherein only brief

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[151] In the case of differences in the depreciation method used for different types of assets, the depreciation method that used for the fixed tangible depreciable assets (e.g., plant, machinery) has been used to identify the firm's depreciation method for the purpose of further analyses.

[152] Alternative combinations of accounting policies and income strategies are presented in Appendix 6-1.

description about the remaining firms was available. Ownership structure for the remaining sample firms was obtained from the Disclosure Database of the CMA.

A question that arises is what cut–off level of ownership creates a "sufficient incentive" for shareholders to engage in monitoring? In previous, mostly American empirical research, concentration of ownership has been measured using various cut–offs which vary from 5% to 10% (5%< cut–offs area <10%) as an indicator of the level at which owners become active in actual firm management (Tosi and Mejia, 1994). In fact, like American firms, Egyptian companies are required to report all individuals or institutions holding 3% or more of their shares. This research aims to test the existing theories in the Egyptian environment, so the researcher suggests that the current study should be compatible with the literature. Therefore, it uses a cut–off of equal or greater than 5% to equal or less than 10% indicate firms in which owners are defined as being active (inactive) in their firms' management. A "grey area" between greater than 5% and less than 10% indicates companies where the researcher cannot arrive at a decision. Overall, no firms in the database have been included in this grey area.

Summary information about the ownership/control structure of the firms drawn from the database is presented in Table 6-23. An analysis of this table shows that, contrary to the respondent firms in the questionnaire survey, the equity of many firms included in the database is widely held[153]. Manager–controlled firms form 68% of the sample. Table 6-23 also presents the descriptive statistics concerning the management bonus schemes of firms drawn from the database. It is clear that a large majority (72%) of the respondent firms employ management bonus schemes.

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[153] The majority of firms quoted on the exchange are primarily owned by relatively small numbers of shareholders or by families that exert similar closeness of ownership and control. Shares in those firms are seldom traded. The current study examines 96 of the most frequently traded companies.

**Table 6-23 Control and usage of bonus schemes in the database**

| Management bonus schemes | Owner–controlled | | Manager–controlled | | All firms | |
|---|---|---|---|---|---|---|
| | Number of firms | % | Number of firms | % | Number of firms | % |
| No bonus scheme | 23 | 74.2 | 4 | 6.2 | 27 | 28.1 |
| Bonus scheme | 8 | 25.8 | 61 | 93.8 | 69 | 71.9 |
| Total | 31 | 100.0 | 65 | 100.0 | 96 | 100.0 |

The substantive literature reports that bonus schemes are more likely to be used in manager–controlled rather than in owner–controlled firms. As Table 6-23 shows, a cross–tabulation of type of control versus use of a bonus scheme provides support for the findings of previous studies, in that 61 firms out of 65 manager–controlled firms selected from the database (about 94%) employ management bonus schemes; the comparative figures for owner–controlled firms was 8 firms out of 31 (about 26%). Subjecting the results reported in Table 6-23 to a test of homogeneity of proportions, confirms that the two ownership/control types of firm differ significantly in the proportion employing a bonus scheme (p–value = 0.000). This result is consistent with the prediction and the evidence reported in the literature (see Dhaliwal et al., 1982; Lewellen et al., 1987; Dempsey et al., 1993).

Leverage for the database firms was measured in two ways: (i) the proportion of total debt to total assets (Press and Weintrop, 1990; Warfield et al., 1995; Rajgopal and Pincus, 2000; Peasnell et al., 2000) and (ii) the proportion of long–term debt to equity (Press and Weintrop, 1990[154]; Lilien and Pastena, 1982). Both these approaches used in the current study concurrently.

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[154] Press and Weintrop, (1990) used four measures for leverage: LTD / BV, LTD / MV, TD / ASSETS and LTD / (MV + LTD) where: LTD was the long–term debt; BV was the book value of equity; MV was the market value of equity; TD was the total debt; ASSETS referred to total assets.

Leverage for these firms was measured by reference to total debt divided by total assets (LEV) as well as by long term debt divided by equity (LEV1)[155]. Leverage characteristics have been identified as a factor that can give rise to pressure to adopt income–increasing methods (see, Chapter 4). Table 6-24 presents the frequency distributions of the debt/total assets ratios (LEV) and debt/equity ratios (LEV1) for the firms selected from the database. The mean debt/total assets ratios (LEV) of the database firms, at 0.598, is higher than the estimated mean leverage in the questionnaire survey (0.37) and is consistent with levels described in preceding studies. The mean leverage was 0.475 in Warfield et al. (1995), 0.416 in Rajgopal and Pincus. (2000) and 0.523 in Peasnell et al. (2000). Also, there is indication that among the database firms, the mean debt/total assets ratios (LEV) are higher than the mean debt/equity ratios (LEV1), (0.598 and 0.287 respectively). The mean long–term debt to equity was 0.68 in Press and Weintrop 1990.

**Table 6-24 Leverage of the database firms**

| Ratios | Debt/total assets (LEV) | | Long–term debt/equity (LEV1) | |
|---|---|---|---|---|
| | Number of firms | % | Number of firms | % |
| <20% | 3 | 3.1 | 62 | 64.6 |
| 20-40(%) | 13 | 13.5 | 10 | 10.4 |
| >40-60(%) | 33 | 34.4 | 9 | 9.4 |
| >60-80(%) | 30 | 31.3 | 5 | 5.2 |
| >80% | 17 | 17.7 | 10 | 10.4 |
| Total | 96 | 100.0 | 96 | 100 |
| | Mean = 0.598 | | Mean = 0.287 | |

Firm's size has been found to be negatively associated with management's choice

[155] Both of the ratios of long–term debt divided by equity and debt divided by total assets are available through Kompass Egypt year–book 2001 for about 70 companies and the two ratios of the remaining 26 have been computed.

of income increasing accounting methods (Hagerman and Zmijewski, 1979). Indeed. size is hypothesised to provide an indication regarding management's decision to use income–decreasing methods (see H3). One explanation is that large firms seek to choose accounting practices that reduce the probability of large earnings in order to avoid possible political attention (regulation and/or taxation). Based on this view, large firms are more likely to choose income–decreasing methods. Watts and Zimmerman (1990) argue that the negative association between income–increasing method choices and size is driven by political exposure suffered by lobbying companies to avoid political visibility. As in the questionnaire survey, the total value of sales (SALES) and the last reported balance sheet value of the total assets (ASSETS) have been used as measures of size. There is no obvious reason to choose one measure of size over other so both are used.

Table 6-25 shows that the size of firms selected from the database are larger than the size of firms included in the questionnaire survey. Panel A of Table 6-25 indicates that 46 firms out of 93 (49.5%) in the firms included in the questionnaire survey have total sales (SALES) of more than 100 million L.E. compared with 67 firms out of 92[156] (72.8%) for the firms included from the database. The mean sales for companies that responded to the survey are estimated at 97 million L.E. which is about a quarter of that for the companies in the database at 426 million L.E.

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[156] Sales figures for 4 firms are missing from the sample of 96 companies.

**Table 6-25 Total sales (SALES) and Total assets (ASSETS) in the survey and database**

| Panel A: Total sales (SALES) | | | | | Panel B: Total assets (ASSETS) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Survey | | Database | | | Survey | | Database | |
| Million L.E. | # firms | % | # firms | % | Million L.E. | # firms | % | # firms | % |
| <10 | 8 | 8.6 | 2 | 2.1 | <50 | 10 | 10.8 | 1 | 1 |
| >10-25 | 11 | 11.8 | 2 | 2.1 | 50-100 | 27 | 29.0 | 7 | 7.3 |
| >25-50 | 10 | 10.8 | 3 | 3.1 | >100-250 | 24 | 25.8 | 23 | 24.0 |
| >50-100 | 18 | 19.4 | 18 | 18.8 | >250-500 | 16 | 17.2 | 17 | 17.7 |
| >100-250 | 46 | 49.5 | 25 | 26.0 | >500-1000 | 16 | 17.2 | 21 | 21.9 |
| >250-500 | - | - | 18 | 18.8 | >1000-2500 | - | - | 13 | 13.5 |
| >500-1000 | - | - | 15 | 15.6 | >2500-5000 | - | - | 7 | 7.3 |
| >1000 | - | - | 9 | 9.4 | >5000 | - | - | 7 | 7.3 |
| Missing | - | - | 4 | 4.2 | Missing | - | - | - | - |
| Total | 93 | 100 | 96 | 100 | Total | 93 | 100 | 96 | 100 |

Furthermore, panel B of Table 6-25 indicates that 16 out of 93 (17%) firms included in the questionnaire survey have total assets (ASSETS) of more than 500 million L.E. compared with 48 out of 96 (50%) firms included from the database. The mean assets for companies that responded to the survey is estimated at 263 million L.E. which is less than a quarter of that for the companies in the database – 1798 million L.E.

### 6.3.3 Descriptive statistics for and correlations among the variables in the database

Descriptive statistics for the companies in the database have been highlighted in Table 6-26. For each variable, the mean, standard deviation, median, maximum, and minimum values have been reported. This table shows that bonus schemes are used by 0.719 of the firms chosen from the database. The proportion of database firms recorded as manager–controlled (MC) is 0.677; firms included in the database therefore have

less concentrated ownership than firms included in the survey. Table 6-26 also indicates that the means for log of total sales and the log of total assets were 2.348 and 2.760 million L.E. respectively[157]. The mean for the log of current liabilities over the same period was about 2.382 million L.E. It appears that the sample firms are much smaller than those examined in prior studies which were mostly American. For example, the mean log sales in Bowen et al. (2002) were $6.651. The mean value of total sales in Hagerman and Zmijewski (1979) was $1,760 million while figure in Press and Weintrop (1990) was $1,911 million. Also, the mean of total assets in Hagerman and Zmijewski (1979) was $1,355 million while the mean log of total assets in Bauwhede et al. (2003) was 15.940 million euro. The average mean of the log value of the equity for the sample firms is 2.249 million L.E. while the median log value is 2.241 million L.E., suggesting that the distribution of equity values is symmetric. The mean log of the equity was $522.64 million in the Rajgopal and Pincus (2000) analysis of oil and gas American firms; this indicates that the sample firms are smaller in size relative to those examined in earlier studies. The accounting choice literature indicates that the political cost hypothesis is generally applicable to large firms like the ones used in Watts and Zimmerman and in subsequent studies[158]. The descriptive statistics in Table 6-26 underscores the differences in firm size between the sample firms and firms examined in prior studies[159]. The table also shows that the mean return on assets of the sample firms was 0.077. Given this low profitability ratio relative to interest rates[160], it

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[157]Current rate 1 L.E.=0.19 US$

[158]See for example Hall, 1993 and Malmquist, 1990.

[159] This difference allows the researcher to test whether or not the political cost hypothesis apply to the sample firms.

[160] Central Bank of Egypt deposit rate currently is about 9.25%.

is possible that profitability could influence the choice of an accounting method. The sales levels of firms drawn from the database are smaller than those examined in the earlier studies, with log of the total sales (SALES) ranging from 0.883 million L.E. to 3.547 million L.E., and having a median value of 2.381 million L.E. The log of the total assets (ASSETS) also is smaller, ranging from 1.615 million L.E. to 4.680 billion L.E. with a median value of 2.732 million L.E. The mean TAXRATE of the sample firms at 0.086 is significantly lower than that found in identified prior studies; e.g. this proportion was 0.31 in Gopalakrishnan (1994) and 0.352 in Hagerman and Zmijewski (1979).

**Table 6-26 Descriptive statistics for the firms in the database**

| *Descriptive statistics (N = 96)* | | | | | |
|---|---|---|---|---|---|
| | Mean | Std. Dev. | Median | Min. | Max. |
| DEP | 0.885 | 0.320 | 1 | 0 | 1 |
| INV | 0.198 | 0.401 | 0 | 0 | 1 |
| MP | 0.719 | 0.452 | 1 | 0 | 1 |
| MC | 0.677 | 0.470 | 1 | 0 | 1 |
| LEV | 0.598 | 0.197 | 0.594 | 0.060 | 0.923 |
| LEV1 | 0.287 | 0.460 | 0.083 | 0 | 2.417 |
| SALES | 2.348 | 0.529 | 2.381 | 0.883 | 3.547 |
| ASSETS | 2.760 | 0.585 | 2.732 | 1.615 | 4.680 |
| EQUITY | 2.249 | 0.497 | 2.241 | 1.048 | 3.319 |
| CUR_LIA | 2.382 | 0.685 | 2.306 | 0.769 | 4.569 |
| CI | 0.865 | 1.715 | 0.300 | 0.001 | 11.872 |
| CR | 0.353 | 0.248 | 0.292 | 0.074 | 1.0 |
| PROFIT | 0.077 | 0.080 | 0.062 | -0.13 | 0.3 |
| TAXRATE | 0.086 | 0.118 | 0.004 | 0.000 | 0.497 |

DEP was coded as one for SLD and zero for otherwise; INV was coded as one for FIFO and zero for otherwise; MC was coded as one if there is no one or group shareholder owning 10% or more of the total shares, and zero for otherwise; MP was coded as one if firm has Management compensation plans, and zero if not; LEV was the total debt divided by total assets; LEV1 was the long term debt divided by equity; SALES referred to log total sales; ASSETS was log total assets; CI was the capital intensity (gross fixed assets/sales); CR was eight firm concentration ratio (percentage of sales); CUR_LIA was log of total current liabilities; EQUITY was log of total value of equity; PROFIT was operating income divided by total assets and TAXRATE was the firm's tax rate calculated by dividing tax expense by net income. All values are measured at fiscal year–end 2001, unless otherwise indicated.

**Table 6-27 Correlation of the independent and control variables for the database (p–values are shown in italics above the diagonal)**

| Variables | MP | LEV | LEV1 | SALES | ASSETS | TAXRATE | BETA | CI | CR | PROFIT |
|---|---|---|---|---|---|---|---|---|---|---|
| MP | 1 | *0.789* | *0.204* | *0.042* | *0.041* | *0.002* | *0.461* | *0.882* | *0.256* | *0.172* |
| LEV | -0.025 | 1 | *0.169* | *0.035* | *0.017* | *0.630* | *0.332* | *0.015* | *0.640* | *0.013* |
| LEV1 | -0.122 | 0.056 | 1 | *0.546* | *0.154* | *0.017* | *0.074* | *0.001* | *0.548* | *0.000* |
| SALES | 0.189* | 0.180* | 0.053 | 1 | *0.000* | *0.456* | *0.309* | *0.366* | *0.992* | *0.484* |
| ASSETS | 0.185* | 0.198* | 0.121 | 0.532** | 1 | *0.060* | *0.123* | *0.002* | *0.322* | *0.009* |
| TAXRATE | 0.301** | -0.043 | -0.217* | 0.064 | -0.160 | 1 | *0.349* | *0.157* | *0.655* | *0.000* |
| BETA | -0.079 | 0.095 | 0.181 | 0.099 | 0.146 | -0.094 | 1 | *0.048* | *0.712* | *0.039* |
| CI | 0.016 | 0.233* | -0.328** | -0.084 | -0.286** | 0.137 | -0.217* | 1 | *0.885* | *0.348* |
| CR | -0.100 | 0.038 | 0.050 | 0.001 | 0.077 | 0.037 | 0.034 | 0.013 | 1 | *0.800* |
| PROFIT | 0.128 | -0.212* | -0.315** | -0.060 | -0.217** | 0.566** | -0.202* | 0.090 | -0.020 | 1 |

*Correlation is significant at the level 0.05 and **correlation is significant at the level 0.01
SALES referred to value of total sales and ASSETS referred to value of total assets.
The abbreviations defined in table 6-26 continue to apply for the remaining variables.

The correlations of the independent and control variables for the database firms are presented in Table 6-27. The results show a positive and significant correlation for the database firms between the management bonus schemes (MP) and total sales (SALES), total value of assets (ASSETS) and TAXRATE (0.189, 0.185 and 0.301 respectively). There is a positive significant correlation between (i) leverage and value of total sales and between (ii) leverage and the value of total assets (0.180 and 0.198 respectively). A negative significant correlation exists between PROFIT and both measures of leveraged (LEV and LEV1) (-0.212, and -0.315 respectively)[161]. Also, there is a negative significant correlation between the long–term debt/equity (LEV1) and TAXRATE (-0.217) and a high positive significant correlation of 0.532 between the total sales values of firm (SALES) and their total assets (ASSETS). Table 6-27 also indicates a significant negative association between total assets (ASSETS) and profit (-0.217).

## 6.4 Summary and conclusion

This chapter presented descriptive statistics regarding the responses to the questionnaire survey and the characteristics of the firms included in the database have been presented. In addition certain pairs of variables have been cross–tabulated in order to describe the association between them.

A number of interesting findings emerge from the descriptive statistics for the independent variables. Firstly, the firms included in the database are smaller than the firms investigated in previous studies. Secondly, the firms included in the survey tend

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[161]This is not expected because PROFIT is measured as earnings before interest and taxes for the financial year divided by the book value of assets; thus, the effect of interest expenses is not included (see Table 5-3).

to be even smaller than the firms in the database. Thirdly, firms in the survey have higher concentration of ownership than firms in the database. Fourthly, management bonus plans are more frequently employed by firms in database than by firms included in the survey. Fifthly, in both the survey and the database there is evidence that manager–controlled firms are more likely than owner–controlled firms to use a bonus scheme to motivate managers. Sixthly, leverage is positively correlated with size of firm (SALES or ASSETS) in both survey and database.

Overall, Tables 6.14 and 6.27 indicate that the correlations between independent variables are fairly consistent across the questionnaire survey and the database. The correlation coefficient for each pair of variables has the same sign in both cases. As a rule the correlation coefficient for each pair of variables show approximately the same levels of significance in both survey and database (i.e. both are not significant, or both are significant at the 0.05 level, or both are significant at the 0.01 level). In only two instances are the levels different (SALES vs. LEV, and SALES vs. MP).

Turning to the dependent variables (depreciation and inventory methods), the descriptive statistics included in this chapter show that the majority of firms included in the survey (80%) and in the database (89%) adopt the SLD method – an income increasing choice. By contrast, the majority of firms in the survey (57%) and in the database (80%) employ an income decreasing inventory valuation method (NO FIFO).

Within this context, the next chapter outlines the results of the formal testing of hypotheses developed in Chapter 4.

# Chapter 7: Data Analysis and Empirical Findings

## – Tests of Hypotheses –

## 7.1 Introduction

This chapter presents tests of the hypotheses which were formulated in Chapter 4. The individual predictions regarding the economic determinants of accounting choices are subjected to preliminary univariate analyses in section 7.2. Regression of the accounting method choice (for depreciation and for inventory) on each economic determinant is performed for (i) the survey and (ii) the database datasets in order to establish whether a statistically significant relationship exits between each accounting method choice and each economic determinant. Section 7.3 contains the results of logistic regression analysis of each accounting method choice against all of the proxies for management's economic motives. Logistic regression is appropriate because each y–variable takes one of only two values. Multiple regression is used because, as demonstrated in Chapter 6, the economic determinants may be correlated with one another. Each hypothesis was tested separately using (i) the survey and (ii) the database. Section 7.4 concludes the present chapter, with a discussion of the findings of the statistical analyses. The findings of the database firms are compared with the results from the questionnaire survey companies.

The general conclusion that emerges from this analysis is that the bonus schemes and leverage contracting hypotheses could explain accounting choices in Egypt. The findings provide enough evidence to reject the null hypotheses $H1_a$, $H1_{Oa}$, $H1_{Ma}$, $H1_b$, $H1_{Ob}$ and $H1_{Mb}$ also there is partial support for the research hypotheses $H2_a$, $H2_{Oa}$, $H2_{Ma}$, $H2_b$, $H2_{Ob}$ and $H2_{Mb}$. The findings also indicate that there is no empirical support from the data for the relevance of the political costs hypothesis in Egypt ($H3_a$, $H3_{Oa}$, $H3_{Ma}$, $H3_b$, $H3_{Ob}$ and $H3_{Mb}$). The results of this study suggest that Egyptian managers may be motivated by similar factors to these observed in studies conducted in the USA

and other Western countries. In contrast, as might have been anticipated, perceptions of political costs are probably influenced by the environments in which firms operate and consequently are not likely to lead to management responses which are consistent on an international scale.

## 7.2 Univariate analysis

Association analysis was utilised to test the relationship between the dependent and independent variables. The association between a firm's characteristics and its accounting method choices relating to depreciation policy decisions and inventory valuation method was examined. The null hypothesis of no association between a dependent variable and the dichotomous independent variables was investigated via the chi–square test of a 2 x 2 contingency table. The null hypothesis of no association between the dependent variables and each of the explanatory variables that was measured on an ordinal scale with more than two levels was investigated by a Kendall's tau–b test. The findings of the investigations are reported in the following sections.

### 7.2.1 Bonus plans and accounting method choices

#### *7.2.1.1 Bonus plans and depreciation policy decisions*

The widespread use of accounting–based compensation schemes (see Tables 6-5 and 6-23 in Chapter 6) suggests that the firm's executives may have a strong incentive to pursue earnings management. The use of such bonus schemes can therefore play a crucial role in determining depreciation policy decisions. For the respondent firms in the questionnaire survey, a chi–square test[162] using a 2 x 2 contingency table was

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[162] To be precise, the likelihood ratio test was employed because it is less susceptible to problems that can arise when the expected frequencies under the null hypothesis take small values (less than 5).

employed for testing the hypotheses $H1_a$, $H1_{Oa}$ and $H1_{Ma}$ (for all firms, owner–controlled firms and manager–controlled firms respectively)[163]. Firstly, for all firms, the likelihood ratio test statistic (reported at the foot of Table 7-1, panel AI) is large enough to conclude that one can firmly reject the null hypothesis in favour of the alternative. The ratio of 25.90 has a p–value of 0.000 which is statistically significant at the 5% level. The frequencies shown in the body of panel AI indicate that the association is in the direction predicted by the alternative hypothesis ($H1_a$); i.e. 49 of the 50 managers who are in firms that have bonus schemes use SLD, whereas 25 out of the 43 managers who are in firms that do not have bonus schemes use SLD. Secondly, for owner-controlled firms, the likelihood ratio of 11.928 has a p–value of 0.0003 for a one-sided test which again is statistically significant at the 5% level. The frequencies shown in the body of panel AII indicate that the association is in the direction predicted by the alternative hypothesis ($H1_{Oa}$); i.e. all but one of the 20 managers who are in firms that have bonus schemes use SLD, whereas only 22 out of the 40 managers who are in firms that do not have bonus schemes use SLD. However, for manager-controlled firms, panel AIII reveals that all of the 33 managers (3 with no bonus scheme and 30 with bonus scheme) employ SLD, thus, no statistics were computed because SLD is constant.

Applying the same test of hypotheses ($H1_a$, $H1_{Oa}$ and $H1_{Ma}$) to the database firms, the findings are also displayed in Table 7-1. Firstly, for all firms, the information in

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[163] $H1_a$ has null hypothesis that there is no association between the employment of management bonus plans and depreciation policy decisions; the alternative hypothesis is that managers of firms with bonus plans are more likely to choose SLD. $H1_{Oa}$ has null hypothesis that there is no association between employment of management bonus plans and depreciation policy decisions in owner-controlled firms; the alternative hypothesis is that managers of owner-controlled firms with bonus plans are more likely to choose SLD. In addition for testing $H1_{Ma}$ has null hypothesis that there is no association between employment of management bonus plans and depreciation policy decisions in manager-controlled firms; the alternative hypothesis is that managers of manager-controlled firms with bonus plans are more likely to choose SLD.

Table 7-1, panel BI, shows that the null hypothesis can again be rejected and that the association is in the direction predicted by the alternative hypothesis ($H1_a$): i.e. all but one of the 69 managers who are in firms that have bonus schemes use SLD, whereas 63% of the 27 managers who are in firms that do not have bonus schemes use SLD. As a result, the likelihood ratio of 22.303 is large and its p–value of 0.000 is very small; this allows us to reject the view that the whole sample of firms has the same propensity to use SLD whether or not they have a bonus scheme to reward managers.

**Table 7-1 Association between Depreciation and Management bonus schemes**

| MP | **Panel AI: Survey (All firms)** | | | **Panel BI: Database (All firms)** | | |
|---|---|---|---|---|---|---|
| | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total |
| No bonus scheme | 18 | 25 | 43 | 10 | 17 | 27 |
| Bonus scheme | 1 | 49 | 50 | 1 | 68 | 69 |
| Total | 19 | 74 | 93 | 11 | 85 | 96 |
| | Likelihood Ratio: 25.900<br>p–value for a one–sided = 0.000 | | | Likelihood Ratio: 22.303<br>p–value for a one–sided = 0.000 | | |
| MP | **Panel AII: Survey (OC)** | | | **Panel BII: Database (OC)** | | |
| | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total |
| No bonus scheme | 18 | 22 | 40 | 8 | 15 | 23 |
| Bonus scheme | 1 | 19 | 20 | 1 | 7 | 8 |
| Total | 19 | 41 | 60 | 9 | 22 | 31 |
| | Likelihood Ratio: 11.928<br>p–value for a one–sided = 0.0003 | | | Likelihood Ratio: 1.603<br>p–value for a one–sided = 0.103 | | |
| MP | **Panel AIII: Survey (MC)** | | | **Panel BIII: Database (MC)** | | |
| | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total |
| No bonus scheme | - | 3 | 3 | 2 | 2 | 4 |
| Bonus scheme | - | 30 | 30 | - | 61 | 61 |
| Total | - | 33 | 33 | 2 | 63 | 65 |
| | | | | Likelihood Ratio: 12.318<br>p–value for a one–sided = 0.000 | | |

MP denotes management bonus schemes, OC denotes owner–controlled firms and MC denotes manager–controlled firms.

Secondly, for owner–controlled firms, the information in Table 7-1, panel BII, shows that the null hypothesis ($H1_{Oa}$) cannot be rejected, as the likelihood ratio of 1.603 has a p–value of 0.103 for a one-sided test which is not statistically significant at the 5% level. Thirdly, for manager–controlled firms, on the other hand, the information

in Table 7-1, panel BIII, shows that the association is in the direction predicted by the alternative hypothesis ($H1_{Ma}$); i.e. all of the 61 managers who are in manager–controlled firms that have bonus schemes use SLD, whereas 2 of the 4 managers who are in firms that do not have bonus schemes use SLD.

In summary, both survey and database samples provide significant evidence in favour of the research hypothesis ($H1_a$) that managers in firms with bonus plans are more likely to choose an income–increasing depreciation method. For owner–controlled firms, survey companies but not database counterparts provide significant support for the association between employment of management bonus plans and depreciation policy decisions (rejection of the null hypothesis $H1_{Oa}$). Further, database counterparts provide significant evidence in favour of the research hypothesis ($H1_{Ma}$) that managers of manager–controlled firms with bonus plans are more likely to choose SLD.

#### *7.2.1.2 Bonus plans and inventory policy decisions*

In the same way, the use of bonus schemes could also play a role in determining inventory policy decisions. For the respondent firms in the questionnaire survey, a chi–square test was employed for testing the hypotheses ($H1_b$, $H1_{Ob}$ and $H1_{Mb}$) which have the null hypothesis that there is no association between employment of management bonus plans and inventory policy decisions; the alternative hypothesis states that managers in firms with bonus plans are more likely to choose the FIFO inventory method.

Firstly, for the all firms, the likelihood ratio test statistic (10.171) reported at the foot of Table 7-2, panel AI, is sizeable and the very small p–value for a one–sided alternative of 0.0005 allows us to reject the null hypothesis in favour of the alternative

($H1_b$). The frequencies shown in the body of this panel indicate that the association is in the direction predicted by the alternative hypothesis. Thus, 29 of the 50 managers who are in firms that have bonus schemes do use FIFO, whereas only 11 out of the 43 managers who are in firms that do not have bonus schemes use this method of inventory valuation. Secondly, for owner-controlled firms, the likelihood ratio of 5.546 has a p–value of 0.009 for a one-sided test which is statistically significant. The frequencies shown in the body of panel AII of Table 7-2 indicate that the association is in the direction predicted by the alternative hypothesis ($H1_{Ob}$); i.e. 10 out of the 20 managers who are in firms that have bonus schemes use FIFO, whereas only 8 out of the 40 managers who are in firms that do not have bonus schemes use FIFO (positive association). However, for manager–controlled firms, the ratio of 2.580 has a p–value of 0.054 for a one-sided test which is not quite statistically significant at the 5% level. The frequencies shown in the body of panel AIII of Table 7-2 indicate that 11 out of the 30 managers who are in firms that have bonus schemes use FIFO, whereas all of the 3 managers who are in firms that do not have bonus schemes use FIFO. The results are not in the direction predicted by the hypothesis $H1_{Mb}$.

Applying the same test of hypotheses ($H1_b$, $H1_{Ob}$ and $H1_{Mb}$) to the firms in the database, the information in Table 7-2, panel BI, shows that the null hypothesis can again be rejected and the association is in the direction predicted by the alternative hypothesis ($H1_b$). Some 18 of the 69 managers who are in firms that have bonus schemes do use FIFO, whereas only one of the 27 managers who is in a firm that does not have bonus schemes uses FIFO. As a consequence, the likelihood ratio of 7.759 has a p–value for a one–sided alternative of 0.003 which is statistically significant. In addition, for owner–controlled firms, the information in Table 7-2, panel BII, shows that the null hypothesis $H1_{Ob}$ can be rejected, as the likelihood ratio of 8.075 has a one-

sided p–value of 0.002 which is statistically significant. Moreover, for manager–controlled firms, on the other hand, the information in Table 7-2, panel BIII, shows that the null hypothesis $H1_{Mb}$ cannot be rejected; although the statistics confirm the existence of a positive relationship, it is not significant; i.e. in manager-controlled firms, 14 of the 61 managers that have bonus schemes use FIFO, whereas none of the 4 managers that do not have bonus schemes use FIFO.

**Table 7-2 Association between Inventory policy and Management bonus schemes**

| MP | **Panel AI: Survey (All firms)** | | | **Panel BI: Database (All firms)** | | |
|---|---|---|---|---|---|---|
| | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total |
| No bonus scheme | 32 | 11 | 43 | 26 | 1 | 27 |
| Bonus scheme | 21 | 29 | 50 | 51 | 18 | 69 |
| Total | 53 | 40 | 93 | 77 | 19 | 96 |
| | Likelihood Ratio: 10.171<br>p–value for a one–sided: 0.0005 | | | Likelihood Ratio: 7.759<br>p–value for a one–sided: 0.003 | | |
| MP | **Panel AII: Survey (OC)** | | | **Panel BII: Database (OC)** | | |
| | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total |
| No bonus scheme | 32 | 8 | 40 | 22 | 1 | 23 |
| Bonus scheme | 10 | 10 | 20 | 4 | 4 | 8 |
| Total | 42 | 18 | 60 | 26 | 5 | 31 |
| | Likelihood Ratio: 5.546<br>p–value for a one–sided: 0.009 | | | Likelihood Ratio: 8.075<br>p–value for a one–sided: 0.002 | | |
| MP | **Panel AIII: Survey (MC)** | | | **Panel BIII: Database (MC)** | | |
| | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total |
| No bonus scheme | - | 3 | 3 | 4 | - | 4 |
| Bonus scheme | 11 | 19 | 30 | 47 | 14 | 61 |
| Total | 11 | 22 | 33 | 51 | 14 | 65 |
| | Likelihood Ratio: 2.580<br>p–value for a one–sided: 0.054 | | | Likelihood Ratio: 2.011<br>p–value for a one–sided: 0.078 | | |

MP denotes management bonus schemes, OC denotes owner-controlled firms and MC denotes manager controlled firms.

Although the general usage of FIFO is lower in the database firms than in the survey companies, both datasets provide significant evidence in favour of the research hypothesis that managers in firms with bonus plans are more likely to choose an income–increasing inventory method ($H1_b$). Further, there an association between the employment of management bonus plans and inventory policy decisions in owner-

controlled firms ($H1_{Ob}$). The overall conclusion to be drawn from the findings above is that the survey and the database provide evidence in support of research hypothesis H1 that managers of firms with bonus plans are more likely to adopt income–increasing accounting choices than those in firms without such bonus plans. Contrary to expectation, this conclusion appears to hold strongly for owner-controlled firms but only partially for manager–controlled firms ($H1_a$, $H1_b$, $H1_{Oa}$, $H1_{Ob}$ and $H1_{Ma}$ but not $H1_{Mb}$) but, as identified in Chapter 6, owner-controlled firms predominantly do not use bonus schemes.

### 7.2.2 Firm's leverage characteristics and accounting methods choice

A firm's leverage characteristics were hypothesised to influence the choice of accounting methods. The leverage characteristics used in this study were the debt/total assets ratios (LEV) for the questionnaire survey and the debt/total assets ratios and debt/equity ratios (LEV1) for the database. Results of testing the association between the leverage and dependent variables (a) for the firms responding in the questionnaire survey and (b) for the firms included in the database are reported in the following sub–sections.

#### *7.2.2.1 Firm's leverage characteristics and depreciation policy decisions*

The nonparametric Kendall's tau–b[164] test was used to test the null hypotheses ($H2_a$, $H2_{Oa}$ and $H2_{Ma}$). Results of Kendall's tau–b test for respondent firms in the questionnaire survey are presented in Table 7-3. Firstly, the results in Table 7-3 panel I indicate that the null hypothesis cannot be rejected (the p–value for a one–sided

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[164] This test is appropriate because it deals with the association between variables measured on an ordinal scale; both SLD and leverage are measured on ordinal scales.

alternative is 0.209 which is greater than the critical level of 0.05). The data do not provide significant support for the debt hypothesis ($H2_a$) that there is an association between a firm's level of the leverage and its depreciation policy decisions: the alternative is that firms with higher leverage will have a greater tendency to use SLD – an income increasing depreciation policy (see Chapter 4). It appears that so far as those firms which responded to the survey are concerned, the likelihood that they will adopt SLD is not associated with their level of leverage. This finding lends no support to the research hypothesis that more highly leveraged firms will be more likely to adopt SLD. Secondly, for owner-controlled firms, the information in Table 7-3, panel II, shows that the null hypothesis cannot be rejected; the p–value for a one–sided alternative is 0.099 which is greater than the level of 0.05. However, for manager-controlled firms, all of the 33 managers employ SLD; thus, no statistics were computed because SLD is constant.

**Table 7-3 Association between Depreciation policy and Leverage for the survey**

| | **Panel I (All firms)** | | | **Panel II: (OC)** | | | **Panel III (MC)** | | |
|---|---|---|---|---|---|---|---|---|---|
| LEV | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total |
| <20% | 7 | 19 | 26 | 7 | 8 | 15 | - | 11 | 11 |
| 20-40 (%) | 6 | 25 | 31 | 6 | 15 | 21 | - | 10 | 10 |
| >40-60 (%) | 2 | 18 | 20 | 2 | 9 | 11 | - | 9 | 9 |
| >60-80 (%) | 4 | 5 | 9 | 4 | 4 | 8 | - | 1 | 1 |
| >80 (%) | - | 7 | 7 | - | 5 | 5 | - | 2 | 2 |
| Total | 19 | 74 | 93 | 19 | 41 | 60 | - | 33 | 33 |
| Kendall's tau–b: 0.078, DF: 4<br>p–value for a one–sided: 0.209 | | | | Kendall's tau–b: 0.150, DF: 4<br>p-value for a one-sided: 0.099 | | | | | |

On the other hand, the results of the Kendall's tau–b test for firms in the database, presented in panel AI of Table 7-4, indicate that there is a statistically significant association between debt/total assets (LEV) of firms and their depreciation policy decisions (the p–values for a one–sided alternative is 0.019). For owner–controlled

firms in the database, results presented in panel AII of Table 7-4 indicate significant evidence in favour of the research hypothesis that the higher the leverage, the greater the likelihood that an owner–controlled firm will choose the SLD method ($H2_{Oa}$); the p–values for a one–sided alternative is 0.001. On the other hand, in panel AIII, the negative value of the Kendall's tau–b does not support the research hypothesis that the higher the leverage, the greater the likelihood that a manager-controlled firm will choose the SLD method ($H2_{Ma}$).

**Table 7-4 Association between Depreciation policy and Leverage for the database**

| **Panel AI: LEV (All firms)** | | | | **Panel BI: LEV1(All firms)** | | |
|---|---|---|---|---|---|---|
| Ratios | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total |
| <20% | 1 | 2 | 3 | 10 | 52 | 62 |
| 20-40 (%) | 3 | 10 | 13 | - | 10 | 10 |
| >40-60 (%) | 5 | 28 | 33 | - | 9 | 9 |
| >60-80 (%) | 1 | 29 | 30 | - | 5 | 5 |
| >80 (%) | 1 | 16 | 17 | 1 | 9 | 10 |
| Total | 11 | 85 | 96 | 11 | 85 | 96 |
| Kendall's tau–b: 0.207, DF:4<br>p–values for a one–sided = 0.019 | | | | Kendall's tau–b: 0.165, DF:4<br>p–values for a one–sided = 0.026 | | |
| **Panel AII: LEV (OC)** | | | | **Panel BII: LEV1 (OC)** | | |
| Ratios | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total |
| <20% | 1 | - | 1 | 8 | 9 | 17 |
| 20-40 (%) | 3 | - | 3 | - | 3 | 3 |
| >40-60 (%) | 4 | 7 | 11 | - | 4 | 4 |
| >60-80 (%) | - | 10 | 10 | - | 1 | 1 |
| >80 (%) | 1 | 5 | 6 | 1 | 5 | 6 |
| Total | 9 | 22 | 31 | 9 | 22 | 31 |
| Kendall's tau–b: 0.500, DF:4<br>p–values for a one–sided = 0.001 | | | | Kendall's tau–b: 0.354, DF:4<br>p–values for a one–sided = 0.010 | | |
| **Panel AIII LEV (MC)** | | | | **Panel BIII: LEV1 (MC)** | | |
| Ratios | Does not use SLD | Uses SLD | Total | Does not use SLD | Uses SLD | Total |
| <20% | - | 2 | 2 | 2 | 43 | 45 |
| 20-40 (%) | - | 10 | 10 | - | 7 | 7 |
| >40-60 (%) | 1 | 21 | 22 | - | 5 | 5 |
| >60-80 (%) | 1 | 19 | 20 | - | 4 | 4 |
| >80 (%) | - | 11 | 11 | - | 4 | 4 |
| Total | 2 | 63 | 65 | 2 | 63 | 65 |
| Kendall's tau–b: -0.009, DF:4<br>p–values for a one–sided = 0.552 | | | | Kendall's tau–b: 0.110, DF:4<br>p–values for a one–sided = 0.076 | | |

LEV referred to Debt/total assets, LEV1 referred to Long–term debt/equity, MP denotes management bonus schemes, OC denotes owner-controlled firms and MC denotes manager-controlled firms.

Moreover panel BI in Table 7-4 indicates that there is also a statistically significant positive association between debt/equity ratios (LEV1) and the use of the SLD method, (the p–value for a one–sided alternative is 0.026). The positive correlation found in each case confirms that higher leveraged firms are more inclined to use SLD. These findings for the database are consistent with the research hypothesis $H2_a$ (for all firms) that the use of income–increasing depreciation reporting methods is positively associated with leverage. For owner–controlled companies, panel BII of Table 7-4 indicates that the higher the debt/equity ratio, the greater the likelihood that an owner–controlled firm will choose the SLD method (significant evidence in favour of the research hypothesis $H2_{Oa}$); the p-value for a one-sided test is 0.010. However, results from manager–controlled firms shows that the null hypothesis $H2_{Ma}$ cannot be rejected; i.e. only 2 of the 65 managers who are in manager–controlled firms do not use SLD – the two firms have debt/equity ratios of <20%.

To sum up, the above analysis indicates that, for firms included in the database, a statistically significant positive association exists between the firm's decision to use SLD and its degree of dependency on borrowing (for all and owner–controlled firms but not for manager–controlled firms). However, this is not the case for the firms that responded to the survey. Possible reasons for the disparity include the generally smaller size of the firms in the survey, and the differences in capital structure and ownership/control of the two sets of firms (survey and database).

#### *7.2.2.2 Firm's leverage characteristics and inventory policy decisions*

Once again, the Kendall's tau–b test has been employed for testing the null hypotheses ($H2_b$, $H2_{Ob}$ and $H2_{Mb}$) that there is no association between the debt ratios of

firms and their inventory valuation method against the alternative that the higher the leverage, the greater the likelihood that a firm will choose the FIFO inventory method, (see Tables 7-5 and 7-6).

The results presented in Table 7-5 indicate that, for the firms that responded to the survey, the null hypothesis of no association between the debt/ total assets ratio of firms and the method of inventory valuation they adopt (for all firms, owner–controlled firms and manager–controlled firms) cannot be rejected; p–values for a one–sided alternative are 0.301, 0.392 and 0.103 respectively and all are greater than 0.05). Although the coefficients are all positive, this result does not provide significant support for the debt hypotheses ($H2_b$, $H2_{Ob}$ and $H2_{Mb}$).

**Table 7-5 Association between Inventory policy and Leverage for the survey**

| | **Panel I: LEV (All firms)** | | | **Panel II: LEV (OC)** | | | **Panel III: LEV (MC)** | | |
|---|---|---|---|---|---|---|---|---|---|
| LEV | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total |
| <20% | 16 | 10 | 26 | 11 | 4 | 15 | 5 | 6 | 11 |
| 20-40 (%) | 17 | 14 | 31 | 14 | 7 | 21 | 3 | 7 | 10 |
| >40-60 (%) | 11 | 9 | 20 | 8 | 3 | 11 | 3 | 6 | 9 |
| >60-80 (%) | 7 | 2 | 9 | 7 | 1 | 8 | - | 1 | 1 |
| >80 (%) | 2 | 5 | 7 | 2 | 3 | 5 | - | 2 | 2 |
| Total | 53 | 40 | 93 | 42 | 18 | 60 | 11 | 22 | 33 |
| Kendall's tau–b: 0.049, DF:4<br>p–values for a one–sided: 0.301 | | | | Kendall's tau–b: 0.033<br>p-value for a one-sided: 0.392 | | | Kendall's tau–b: 0.192<br>p-value for a one-sided: 0.103 | | |

LEV referred to debt/total assets ratios, OC denotes owner-controlled firms and MC denotes manager-controlled firms.

Similarly, the association between the firms' inventory policy choices and their leverage (whether measured by debt/total assets or by long–term debt/equity ratios) was examined for companies in the database. The results presented in Table 7-6 do not permit a rejection of the null hypotheses for $H2_b$, $H2_{Ob}$ and $H2_{Mb}$ (the one sided p-values are higher than the significance level 0.05). Again, these findings do not provide

support for the debt hypotheses[165].

**Table 7-6 Association between Inventory policy and Leverage for the database**

| **Panel AI: LEV (All firms)** | | | | **Panel BI: LEV1(All firms)** | | |
|---|---|---|---|---|---|---|
| Ratios | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total |
| <20% | 3 | - | 3 | 49 | 13 | 62 |
| 20-40 (%) | 9 | 4 | 13 | 9 | 1 | 10 |
| >40-60 (%) | 27 | 6 | 33 | 9 | - | 9 |
| >60-80 (%) | 23 | 7 | 30 | 3 | 2 | 5 |
| >80 (%) | 15 | 2 | 17 | 7 | 3 | 10 |
| Total | 77 | 19 | 96 | 77 | 19 | 96 |
| Kendall's tau–b: 0.050, DF:4<br>p–values for a one–sided = 0.289 | | | | Kendall's tau–b: 0.002, DF:4<br>p–values for a one–sided = 0.492 | | |
| **Panel AII: LEV (OC)** | | | | **Panel BII: LEV1 (OC)** | | |
| Ratios | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total |
| <20% | 1 | - | 1 | 13 | 4 | 17 |
| 20-40 (%) | 3 | - | 3 | 3 | - | 3 |
| >40-60 (%) | 10 | 1 | 11 | 4 | - | 4 |
| >60-80 (%) | 7 | 3 | 10 | 1 | - | 1 |
| >80 (%) | 5 | 1 | 6 | 5 | 1 | 6 |
| Total | 26 | 5 | 31 | 26 | 5 | 31 |
| Kendall's tau–b: 0.188, DF:4<br>p–values for a one–sided = 0.089 | | | | Kendall's tau–b: -0.156, DF:4<br>p–values for a one–sided = 0.819 | | |
| **Panel AIII LEV (MC)** | | | | **Panel BIII: LEV1 (MC)** | | |
| Ratios | NO FIFO | FIFO | Total | NO FIFO | FIFO | Total |
| <20% | 2 | - | 2 | 36 | 9 | 45 |
| 20-40 (%) | 6 | 4 | 10 | 6 | 1 | 7 |
| >40-60 (%) | 17 | 5 | 22 | 5 | - | 5 |
| >60-80 (%) | 16 | 4 | 20 | 2 | 2 | 4 |
| >80 (%) | 10 | 1 | 11 | 2 | 2 | 4 |
| Total | 51 | 14 | 65 | 51 | 14 | 65 |
| Kendall's tau–b: -0.145, DF:4<br>p–values for a one–sided = 0.909 | | | | Kendall's tau–b: 0.093, DF:4<br>p–values for a one–sided = 0.240 | | |

LEV referred to Debt/total assets, LEV1 referred to Long–term debt/equity, MP denotes management bonus schemes, OC denotes owner-controlled firms and MC denotes manager-controlled firms.

To sum up, both of the above analyses of the responses to the survey and of the database indicate no significant relationship between a firm's decision to use FIFO and its degree of dependency on borrowing. Neither survey nor database results provide

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[165] $H2_b$ indicates that the higher the leverage, the greater the likelihood that a firm will choose the FIFO inventory method, $H2_{Ob}$ indicates that the higher the leverage, the greater the likelihood that an owner–controlled firm will choose the FIFO inventory method and $H2_{Mb}$ indicates that the higher the leverage, the greater the likelihood that a manager-controlled firm will choose the FIFO inventory method.

evidence in support of hypotheses $H2_b$, $H2_{Ob}$ and $H2_{Mb}$.

### 7.2.3 Firm's size and its accounting methods choice

Size is used in this study as a proxy variable for political visibility (Pacecca, 1995). Hagerman and Zmijewski (1979) and Gopalakrishnan (1994) used total sales and the book value of assets as indications of size. The current study measured size using three parameters, namely current market value (SIZE1), total value of sales (SALES) and the last reported balance sheet value of the total assets (ASSETS). However, the analysis of the responses to the questionnaire survey did not use current market value (SIZE1) because many respondents did not provide that data. As there was no identified reason to prefer one of the remaining measures of size, both the total value of sales (SALES) and value of the total assets (ASSETS) were used in the analysis as proxies for political costs.

#### *7.2.3.1 Size of the firm and its depreciation policy decisions*

The Kendall's tau–b test was used for testing the null hypothesis that there is no association between the size of firms and their depreciation policy decisions against the alternative hypothesis that the larger the firm, the lesser the likelihood it will choose the income increasing depreciation method (for all firms, owner–controlled firms and manager–controlled firms). For responses to the survey, the size variables (total sales and total assets) were independently cross–tabulated against the use of SLD. Table 7-7 panel A and panel B show the results. The Kendall's tau–b test statistics and the p–values for a one–sided test of association are also shown in the table.

**Table 7-7 Association between Depreciation policy and Size for the survey**

| **Panel AI: SALES (All firms)** | | | | **Panel BI: ASSETS (All firms)** | | | |
|---|---|---|---|---|---|---|---|
| Million L.E. | Does not use SLD | Uses SLD | Total | Million L.E. | Does not use SLD | Uses SLD | Total |
| <10 | 1 | 7 | 8 | <50 | 2 | 8 | 10 |
| >10-25 | 3 | 8 | 11 | 50-100 | 6 | 21 | 27 |
| >25-50 | 5 | 5 | 10 | >100-250 | 9 | 15 | 24 |
| >50-100 | 5 | 13 | 18 | >250-500 | - | 16 | 16 |
| >100 | 5 | 41 | 46 | >500 | 2 | 14 | 16 |
| Total | 19 | 74 | 93 | Total | 19 | 74 | 93 |
| Kendall's tau–b: 0.175, DF:4<br>p–value for a one–sided = 0.973 | | | | Kendall's tau–b: 0.112, DF:4<br>p–value for a one–sided = 0.907 | | | |
| **Panel AII: SALES (OC)** | | | | **Panel BII: ASSETS (OC)** | | | |
| Million L.E. | Does not use SLD | Uses SLD | Total | Million L.E. | Does not use SLD | Uses SLD | Total |
| <10 | 1 | 3 | 4 | <50 | 2 | 5 | 7 |
| >10-25 | 3 | 6 | 9 | 50-100 | 6 | 12 | 18 |
| >25-50 | 5 | 4 | 9 | >100-250 | 9 | 8 | 17 |
| >50-100 | 5 | 9 | 14 | >250-500 | - | 9 | 9 |
| >100 | 5 | 19 | 24 | >500 | 2 | 7 | 9 |
| Total | 19 | 41 | 60 | Total | 19 | 41 | 60 |
| Kendall's tau–b: 0.138, DF:4<br>p–value for a one –sided = 0.889 | | | | Kendall's tau–b: 0.105, DF:4<br>p–value for a one –sided = 0.830 | | | |
| **Panel AIII: SALES (MC)** | | | | **Panel BIII: ASSETS (MC)** | | | |
| Million L.E. | Does not use SLD | Uses SLD | Total | Million L.E. | Does not use SLD | Uses SLD | Total |
| <10 | - | 4 | 4 | <50 | - | 3 | 3 |
| >10-25 | - | 2 | 2 | 50-100 | - | 9 | 9 |
| >25-50 | - | 1 | 1 | >100-250 | - | 7 | 7 |
| >50-100 | - | 4 | 4 | >250-500 | - | 7 | 7 |
| >100 | - | 22 | 22 | >500 | - | 7 | 7 |
| Total | - | 33 | 33 | Total | - | 33 | 33 |

SALES referred to the total sales, ASSETS referred to the total assets, OC denotes owner-controlled firms and MC denotes managers-controlled firms.

The frequencies presented in panel AI of Table 7-7 appear to suggest that the smallest firms and the largest firms use SLD more than their medium sized counterparts[166]. However tau here takes positive values, so the null hypothesis cannot be rejected; the alternative of a negative association between the total value of sales (SALES) and use of SLD is not supported by this evidence ($H3_a$). For owner-controlled

[166] That is the case also for owner-controlled and manager-controlled firms.

firms, the information in Table 7-7, panel AII, shows that tau here takes a positive value that is not significant at the 5% level, however, according to the alternative hypothesis, the sign is predicted to be negative. Thus, the p–value for the appropriate one–sided alternative should be larger than 0.05. Consequently, that null hypothesis that there is no association between the size of the owner–controlled firm and the use of the SLD method cannot be rejected ($H3_{Oa}$); the p–value for a one–sided alternative is 0.889 which is greater than the level of 0.05. However, for manager–controlled firms, all of the 33 managers employ SLD; thus, no statistics were computed because SLD is constant.

The frequencies presented in panel BI of Table 7-7 also show a positive value for the relationship that is not statistically significant, so the null hypothesis cannot be rejected, but the alternative of a negative association between the total assets (ASSETS) and use of SLD receives no support ($H3_a$). These findings do not provide support for the political visibility hypothesis ($H3_{Oa}$) that the larger the owner–controlled firm, the lesser the likelihood that it will choose the SLD method (see Chapter 4). Indeed, it appears that, contrary to the prediction of the research hypothesis, the *SIZE* coefficient is positive and not significant. Again, for manager–controlled firms ($H3_{Ma}$), no statistics were computed because SLD is constant.

**Table 7-8 Association between Depreciation policy and Size for the database**

| **Panel AI: SALES (All firms)** | | | | **Panel BI: ASSETS (All firms)** | | | |
|---|---|---|---|---|---|---|---|
| Million L.E. | Does not use SLD | Uses SLD | Total | Million L.E. | Does not use SLD | Uses SLD | Total |
| <10 | - | 2 | 2 | <50 | - | 1 | 1 |
| >10-25 | - | 2 | 2 | 50-100 | 1 | 6 | 7 |
| >25-50 | 1 | 2 | 3 | >100-250 | 6 | 17 | 23 |
| >50-100 | 4 | 14 | 18 | >250-500 | 1 | 16 | 17 |
| >100-250 | 3 | 22 | 25 | >500-1000 | 2 | 19 | 21 |
| >250-500 | 2 | 16 | 18 | >1000-2500 | 1 | 12 | 13 |
| >500-1000 | - | 15 | 15 | >2500-5000 | - | 7 | 7 |
| >1000 | - | 9 | 9 | >5000 | - | 7 | 7 |
| Total | 10 | 82 | 92 | Total | 11 | 85 | 96 |
| Kendall's tau–b: 0.191, DF:7<br>P–value for a one–sided = 0.989 | | | | Kendall's tau–b: 0.185, DF:7<br>p–value for a one–sided = 0.985 | | | |
| **Panel AII: SALES (OC)** | | | | **Panel BII: ASSETS (OC)** | | | |
| Million L.E. | Does not use SLD | Uses SLD | Total | Million L.E. | Does not use SLD | Uses SLD | Total |
| <10 | - | 2 | 2 | <50 | - | - | - |
| >10-25 | - | - | - | 50-100 | - | 2 | 2 |
| >25-50 | - | - | - | >100-250 | 5 | 4 | 9 |
| >50-100 | 3 | 7 | 10 | >250-500 | 1 | 5 | 6 |
| >100-250 | 3 | 3 | 6 | >500-1000 | 2 | 6 | 8 |
| >250-500 | 2 | 1 | 3 | >1000-2500 | 1 | 2 | 3 |
| >500-1000 | - | 3 | 3 | >2500-5000 | - | 1 | 1 |
| >1000 | - | 5 | 5 | >5000 | - | 2 | 2 |
| Total | 8 | 21 | 29 | Total | 9 | 22 | 31 |
| Kendall's tau–b: 0.094, DF:7<br>P–value for a one–sided = 0.745 | | | | Kendall's tau–b: 0.178, DF:7<br>p–value for a one–sided = 0.881 | | | |
| **Panel AIII: SALES (MC)** | | | | **Panel BIII: ASSETS (MC)** | | | |
| Million L.E. | Does not use SLD | Uses SLD | Total | Million L.E. | Does not use SLD | Uses SLD | Total |
| <10 | - | - | - | <50 | - | 1 | 1 |
| >10-25 | - | 2 | 2 | 50-100 | 1 | 4 | 5 |
| >25-50 | 1 | 2 | 3 | >100-250 | 1 | 13 | 14 |
| >50-100 | 1 | 7 | 8 | >250-500 | - | 11 | 11 |
| >100-250 | - | 19 | 19 | >500-1000 | - | 13 | 13 |
| >250-500 | - | 15 | 15 | >1000-2500 | - | 10 | 10 |
| >500-1000 | - | 12 | 12 | >2500-5000 | - | 6 | 6 |
| >1000 | - | 4 | 4 | >5000 | - | 5 | 5 |
| Total | 2 | 61 | 63 | Total | 2 | 63 | 65 |
| Kendall's tau–b: 0.231, DF:7<br>P–value for a one–sided = 0.930 | | | | Kendall's tau–b: 0.205, DF:7<br>p–value for a one–sided = 0.927 | | | |

SALES referred to the total sales, ASSETS referred to the total assets, OC denotes owner-controlled firms and MC denotes managers-controlled firms.

Similar behaviour to that shown in Table 7-7 can be seen in panels A and B of Table 7-8 that refer to the database. Again Kendall's tau–b test of the null hypothesis of no association against the alternative that larger firms are less likely to use SLD. leads to the null being preferred to the alternative. Indeed the evidence from the database lies in the opposite direction to the political cost hypothesis. Again, these findings contradict the political costs hypothesis ($H3_a$).

For the split data, results shown in panel AII and panel BII of Table 7-8 do not provide significant evidence in favour of the research hypothesis that the larger the owner-controlled firm, the lesser the likelihood it will choose the SLD method ($H3_{Oa}$). Similarly, results that shown in panel AIII and panel BIII of Table 7-8 do not provide significant evidence in favour of the research hypothesis that the larger the manager-controlled firm, the lesser the likelihood it will choose the SLD method ($H3_{Ma}$).

To sum up, both the univariate analysis of the responses to the survey and of the database failed to find support for a negative relationship between the firm's decision to use SLD and its size. Contrary to the findings reported in some of the earlier literature, the present results (for all firms) suggest a positive association between a firm adopting SLD and its size. This result is not surprising in Egypt. As indicated in Chapter 2, large firms operating in Egypt are unlikely to face political costs; consequently, the factors affecting the accounting choices are most likely to be those identified in the hypotheses H1 and H2 – which work in the opposite direction to H3 (see Tables 6-14 and 6-27). Watts and Zimmerman (1978) suggest that political costs, which are represented by the *SIZE* variables, are only important for very large firms (such as oil companies). They argue that there is a threshold effect in other firms, so that minimizing political visibility is not likely to be a major concern for most businesses. That perception is

supported by a study by Zmijewski and Hagerman (1981), which found that the *SIZE* coefficient was positive and not significant. The relatively small size of the firms in the samples in the present study and the political environment in Egypt arguably make the political costs hypothesis largely irrelevant to that country.

According to the results reported in Tables 7-7 and 7-8 (panels AII and BII) about the owner–controlled firms, contrary to the prediction, the negative association between sizes of owner–controlled firms and the probability of adopting SLD is not found. Possible reasons for the disparity include the likelihood that closely–held firms obtain greater levels of corporate debt as compared to firms which are widely–held (Kim and Sorenson, 1986; Jensen and Meckling, 1976). Thus, the factors affecting the accounting choices are most likely to be those identified in the hypotheses H2. Furthermore, the results reported in Tables 7-7 and 7-8 (panels AIII and BIII) about the large manager–controlled firms do not provide evidence to support the hypothesised relationship between the size of manager–controlled firms and the likelihood of adopting of SLD. One can assume that, although politicians may interpret high reported profits as evidence that a certain closely–held firm enjoys a monopolistic status, large widely-held firms which earn high earnings levels may be viewed with appreciation. Given that the executives of manager–controlled firms are hypothesised, *ceteris paribus,* to make accounting choices and report accounting income in the most positive way, thus they are more likely to forego political costs in order to report higher reported income because it may impact on their reputations. Therefore, they are assumed to prefer higher rather than lower reported earnings.

### *7.2.3.2 Size of the firm and its inventory policy decisions*

The Kendall's tau–b test was employed for testing the null hypothesis that there is no association between the size of the firm and its adopted inventory valuation method. The alternative research hypothesis is that larger firms will be less likely to use FIFO. The results of the Kendall's tau–b tests for those responding in the questionnaire survey are presented in Table 7-9, panel A and panel B. Firstly, for all firms included in the questionnaire survey, the results indicate that there is a positive association between the total sales (SALES) and adopting FIFO; in the opposite direction to the political cost hypothesis ($H3_b$)[167]. However, there is no statistically significant association between the total assets (ASSETS) of firms and their inventory valuation method adopted, (the p–value for a one–sided alternative is 0.898 which is greater than 0.05). Secondly, for owner-controlled firms, results presented in Table 7-9, panel AII and panel BII, indicate that there is a positive association between the total assets (ASSETS) in the closely-held firms included in the questionnaire survey and the likelihood of adopting FIFO; in the opposite direction to $H3_{Ob}$[168]. However, there is no statistically significant association between the total sales (SALES) of closely-held firms and the inventory valuation which they have adopted, (the p–value for a one–sided alternative is 0.939 which is greater than 0.05). Similarly, there is no statistically significant association between the *SIZE* variables (SALES and ASSETS) of manager-controlled firms and their inventory valuation method adopted (the p–value for a one–sided alternative is 0.438 and 0.281 respectively and both are greater than 0.05). This process takes account of the predicted sign of the coefficient (panel AIII and panel BIII of Table 7-9).

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[167] P-value calculated at 0.017 in the opposite sign, so the appropriate one-sided alternative should be larger than 0.05 (1 - 0.017 = 0.983).

[168] P-value calculated at 0.041 in the opposite sign, so the appropriate one-sided alternative should be larger than 0.05 (1 - 0.041 = 0.959).

**Table 7-9 Association between Inventory policy and Size for the survey**

| **Panel AI: SALES (All firms)** | | | |
|---|---|---|---|
| Million L.E. | NO FIFO | FIFO | Total |
| <10 | 5 | 3 | 8 |
| >10-25 | 7 | 4 | 11 |
| >25-50 | 7 | 3 | 10 |
| >50-100 | 14 | 4 | 18 |
| >100 | 20 | 26 | 46 |
| Total | 53 | 40 | 93 |
| Kendall's tau–b: 0.200, DF:4<br>p–value for a one–sided = 0.983 | | | |

| **Panel BI: ASSETS (All firms)** | | | |
|---|---|---|---|
| Million L.E. | NO FIFO | FIFO | Total |
| <50 | 5 | 5 | 10 |
| 50-100 | 18 | 9 | 27 |
| >100-250 | 18 | 6 | 24 |
| >250-500 | 3 | 13 | 16 |
| >500 | 9 | 7 | 16 |
| Total | 53 | 40 | 93 |
| Kendall's tau–b: 0.122, DF:4<br>p–value for a one–sided = 0.898 | | | |

| **Panel AII: SALES (OC)** | | | |
|---|---|---|---|
| Million L.E. | NO FIFO | FIFO | Total |
| <10 | 3 | 1 | 4 |
| >10-25 | 6 | 3 | 9 |
| >25-50 | 7 | 2 | 9 |
| >50-100 | 14 | - | 14 |
| >100 | 12 | 12 | 24 |
| Total | 42 | 18 | 60 |
| Kendall's tau–b: 0.197, DF:4<br>p–value for a one–sided = 0.939 | | | |

| **Panel BII: ASSETS (OC)** | | | |
|---|---|---|---|
| Million L.E. | NO FIFO | FIFO | Total |
| <50 | 5 | 2 | 7 |
| 50-100 | 15 | 3 | 18 |
| >100-250 | 14 | 3 | 17 |
| >250-500 | 2 | 7 | 9 |
| >500 | 6 | 3 | 9 |
| Total | 42 | 18 | 60 |
| Kendall's tau–b: 0.210, DF:4<br>p–value for a one–sided = 0.959 | | | |

| **Panel AIII: SALES (MC)** | | | |
|---|---|---|---|
| Million L.E. | NO FIFO | FIFO | Total |
| <10 | 2 | 2 | 4 |
| >10-25 | 1 | 1 | 2 |
| >25-50 | - | 1 | 1 |
| >50-100 | - | 4 | 4 |
| >100 | 8 | 14 | 22 |
| Total | 11 | 22 | 33 |
| Kendall's tau–b: -0.027, DF:4<br>p–value for a one–sided = 0.438 | | | |

| **Panel BIII: ASSETS (MC)** | | | |
|---|---|---|---|
| Million L.E. | NO FIFO | FIFO | Total |
| <50 | - | 3 | 3 |
| 50-100 | 3 | 6 | 9 |
| >100-250 | 4 | 3 | 7 |
| >250-500 | 1 | 6 | 7 |
| >500 | 3 | 4 | 7 |
| Total | 11 | 22 | 33 |
| Kendall's tau–b: -0.087, DF:4<br>p–value for a one–sided = 0.281 | | | |

SALES referred to the total sales, ASSETS referred to the total assets, OC denotes owner-controlled firms and MC denotes managers controlled firms.

Kendall's tau–b was used to test the association between the inventory policy choices of sample firms included in the database and their sizes (see Table 7-10, panel A and panel B). The results presented in panels AI and BI of Table 7-10 indicate that there is no statistically significant association between the *SIZE* variables (SALES and ASSETS) of firms and their inventory valuation policies (the one sided p–values at 0.254 and 0.637 are greater than 0.05); do not provide support for $H3_b$.

**Table 7-10 Association between Inventory policy and Size for the database**

| **Panel AI: SALES (All firms)** | | | | **Panel BI: ASSETS (All firms)** | | | |
|---|---|---|---|---|---|---|---|
| Million L.E. | NO FIFO | FIFO | Total | Million L.E. | NO FIFO | FIFO | Total |
| <10 | 1 | 1 | 2 | <50 | 1 | - | 1 |
| >10-25 | 2 | - | 2 | 50-100 | 6 | 1 | 7 |
| >25-50 | 3 | - | 3 | >100-250 | 19 | 4 | 23 |
| >50-100 | 14 | 4 | 18 | >250-500 | 14 | 3 | 17 |
| >100-250 | 17 | 8 | 25 | >500-1000 | 15 | 6 | 21 |
| >250-500 | 16 | 2 | 18 | >1000-2500 | 9 | 4 | 13 |
| >500-1000 | 13 | 2 | 15 | >2500-5000 | 7 | - | 7 |
| >1000 | 7 | 2 | 9 | >5000 | 6 | 1 | 7 |
| Total | 73 | 19 | 92 | Total | 77 | 19 | 96 |
| Kendall's tau–b: -0.060, DF:7<br>p–value for a one–sided = 0.254 | | | | Kendall's tau–b: 0.029, DF:7<br>p–value for a one–sided = 0.637 | | | |
| **Panel AII: SALES (OC)** | | | | **Panel BII: ASSETS (OC)** | | | |
| Million L.E. | NO FIFO | FIFO | Total | Million L.E. | NO FIFO | FIFO | Total |
| <10 | 1 | 1 | 2 | <50 | - | - | - |
| >10-25 | - | - | - | 50-100 | 2 | | 2 |
| >25-50 | - | - | - | >100-250 | 7 | 2 | 9 |
| >50-100 | 8 | 2 | 10 | >250-500 | 5 | 1 | 6 |
| >100-250 | 6 | - | 6 | >500-1000 | 8 | | 8 |
| >250-500 | 3 | - | 3 | >1000-2500 | 2 | 1 | 3 |
| >500-1000 | 2 | 1 | 3 | >2500-5000 | 1 | - | 1 |
| >1000 | 4 | 1 | 5 | >5000 | 1 | 1 | 2 |
| Total | 24 | 5 | 29 | Total | 26 | 5 | 31 |
| Kendall's tau–b: -0.086, DF:7<br>p–value for a one–sided = 0.335 | | | | Kendall's tau–b: 0.054, DF:7<br>p–value for a one–sided =0.617 | | | |
| **Panel AIII: SALES (MC)** | | | | **Panel BIII: ASSETS (MC)** | | | |
| Million L.E. | NO FIFO | FIFO | Total | Million L.E. | NO FIFO | FIFO | Total |
| <10 | - | - | - | <50 | 1 | - | 1 |
| >10-25 | 2 | - | 2 | 50-100 | 4 | 1 | 5 |
| >25-50 | 3 | - | 3 | >100-250 | 12 | 2 | 14 |
| >50-100 | 6 | 2 | 8 | >250-500 | 9 | 2 | 11 |
| >100-250 | 11 | 8 | 19 | >500-1000 | 7 | 6 | 13 |
| >250-500 | 13 | 2 | 15 | >1000-2500 | 7 | 3 | 10 |
| >500-1000 | 11 | 1 | 12 | >2500-5000 | 6 | - | 6 |
| >1000 | 3 | 1 | 4 | >5000 | 5 | - | 5 |
| Total | 49 | 14 | 63 | Total | 51 | 14 | 65 |
| Kendall's tau–b: -0.096, DF:7<br>p–value for a one–sided = 0.175 | | | | Kendall's tau–b: -0.004, DF:7<br>p–value for a one–sided =0.481 | | | |

SALES referred to the total sales, ASSETS referred to the total assets, OC denotes owner-controlled firms and MC denotes managers controlled firms.

Moreover, the results presented in panels AII and BII of Table 7-10 do provide some but not significant support for $H3_{Ob}$ that the larger the owner–controlled firm, the

lesser the likelihood that it will choose the FIFO inventory method. Similarly, results presented in panels AIII and BIII of Table 7-10 do provide some but not significant support for $H3_{Mb}$ that the larger the manager-controlled firm, the lesser the likelihood it will choose the FIFO inventory method. The results do not permit a rejection of the null hypothesis. The observed relationships appear to be in the direction contrary to the political cost hypothesis. Thus, no evidence has been found to support the hypothesis that a firm's inventory policy is related to its size. This result does not provide support for the political visibility hypothesis ($H3_b$, $H3_{Ob}$ and $H3_{Mb}$).

To sum up, the univariate analysis of the responses to the questionnaire survey and analysis of the database provide no evidence to support H3 relating to the political costs hypothesis (that large firms prefer an income–decreasing accounting option). No evidence of that type of relationship has been found[169].

### 7.2.4 Control variables and accounting choice policy

Control variables are only used in the database analysis. The logistic models which were developed for the current study use BETA, CI, CR and PROFIT as control variables for the depreciation policy decisions and BETA, CI, CR, PROFIT and TAXRATE as the control variables for the choices of inventory valuation methods (see Chapter 5).

Bivariate correlation statistics were utilized for testing the associations between the control variables and the dependent variables. The results are summarized in Table 7-11 and indicate that there are no statistically significant correlations between any of

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[169] One can interpret the present finding that size is positively associated with leverage in a number of ways. Large firms may have better access to debt (Marsh, 1982; Baskin, 1989; Chang and Rhee, 1990; Bennets and Donnelly, 1993; Charitou and Vafeas, 1998; Adedeji, 1998) and are likely to have the funds necessary to pursue projects with positive net present values. Thus, the large firms may not really face significant pressure to adopt income decreasing inventory valuation methods.

the control variables and the depreciation method, as significance levels of the observed relationships are higher than the cut–off point of 0.05.

**Table 7-11 Correlation between the control and dependent variables**

| Variables | BETA | CI | CR | PROFIT | TAXRATE |
|---|---|---|---|---|---|
| Predicted sign | - | - | - | - | - |
| Depreciation | -0.082<br>p = 0.476 | -0.035<br>p = 0.740 | -0.080<br>p = 0.440 | -0.021<br>p = 0.842 | - |
| Inventory | -0.242<br>p = 0.034* | -0.191<br>p = 0.068 | 0.058<br>p = 0.573 | -0.024<br>p = 0.819 | -0.020<br>p = 0.848 |

*Significant at the level 0.05. BETA was computed using the daily returns around December 31, 2000 and a value weighted market index; it was obtained from the CMA in Cairo, CI was the fixed assets divided by total sales, CR was measured by eight–firms concentration ratios for industries (percentage of sales), PROFIT was measured as earnings before interest and taxes for the financial year divided by the book value of assets and TAXRATE was measured as tax expense divided by net income.

The results of the tests of association between the control variables and inventory valuation methods are also summarized in Table 7-11 and indicate that there is a negative and statistically significant correlation between BETA and the use of FIFO (p–value = 0.034). The table indicates that the observed associations of the other control variables with inventory method are not statistically significant. This study adopted no hypotheses concerning the control variables.

### 7.2.5 Univariate analysis: concluding remarks

Taken together, (Table 7-1 to Table 7-11), the results of the univariate analyses are summarised in Table 7-12 and indicate that, MP, which is a proxy for management incentive plans, is significantly positively associated with management's choice of income–increasing methods (depreciation and inventory) consistently across the questionnaire survey and the database firms. The univariate results support the prediction that managers with bonus plans are more likely to adopt income–increasing

accounting choices than those without bonus plans ($H1_a$ and $H1_b$). Also, the results support the prediction that managers of owner-controlled firms with bonus plans are more likely to adopt income–increasing accounting choices than those without bonus plans ($H1_{Oa}$ and $H1_{Ob}$). While the results support the prediction that managers of manager-controlled firms with bonus plans are more likely to choose SLD than those without such bonus plans ($H1_{Ma}$), they do not support the prediction that managers of manager-controlled firms with bonus plans are more likely to choose the FIFO inventory method ($H1_{Mb}$); however, the p-value of 0.078 for this latter test is not too far from the significance level of 0.05 (see panel BIII of Table 7-2).

LEV, which is a proxy for the existence and tightness of a firm's debt covenants, is positively and significantly associated with management's choice of income increasing depreciation methods in the database but the association is not significant in the questionnaire survey (see panel I of Table 7-3 and panel AI and panel BI of Table 7-4). The coefficient of the association between LEV and management's choice of income increasing inventory method is positive but the association is not statistically significant in either the questionnaire survey or the database. The univariate results present some support for the hypothesis that the higher the leverage, the greater the likelihood that a firm will choose the income increasing depreciation methods ($H2_a$). On the other hand, the results presented do not support the prediction that the higher the leverage, the greater the likelihood that a firm will choose the income increasing inventory valuation method ($H2_b$). Also, the results support the prediction that the higher the leverage, the greater the likelihood that an owner-controlled firm will choose the SLD method ($H2_{Oa}$) (across the database but is not significant for the questionnaire survey) but the results do not support the prediction that the greater the likelihood that an owner-controlled firm will choose the FIFO inventory method ($H2_{Ob}$). Overall, the

results do not support the hypothesis that the use of income–increasing reporting methods is positively associated with leverage in manager-controlled firms ($H2_{Ma}$ and $H2_{Mb}$).

**Table 7-12 A summary for results of the univariate analysis**

| **Panel A: Support for H1 (Bonus hypothesis)** | | | | | | |
|---|---|---|---|---|---|---|
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | Y<br>p = 0.000 | Y<br>p = 0.000 | Y<br>p = 0.0005 | Y<br>p = 0.003 | Y | Y |
| Null rejected for OC firms | Y<br>p = 0.0003 | N<br>p = 0.103 | Y<br>p = 0.009 | Y<br>p = 0.002 | Y | P |
| Null rejected for MC firms | a | Y<br>p = 0.000 | N<br>p = 0.054 | N<br>p = 0.078 | P | P |
| H1 supported | Y | P | P | P | P | P |
| **Panel B: Support for H2 (Leverage hypothesis)** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N<br>p = 0.209 | Y<br>p = 0.019<br>and 0.026 | N<br>p = 0.301 | N<br>p = 0.289<br>and 0.492 | N | P |
| Null rejected for OC firms | N<br>p = 0.099 | Y<br>p = 0.001<br>and 0.010 | N<br>p = 0.392 | N<br>p = 0.089<br>and 0.181 | N | P |
| Null rejected for MC firms | a | N<br>p = 0.552<br>and 0.076 | N<br>p = 0.103 | N<br>p = 0.091<br>and 0.240 | N | N |
| H2 supported | N | P | N | N | N | P |
| **Panel C: Support for H3 (Political costs hypothesis)** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N<br>p = 0.973<br>and 0.907 | N<br>p = 0.989<br>and 0.985 | N<br>p = 0.983<br>and 0.898 | N<br>p = 0.254<br>and 0.637 | N | N |
| Null rejected for OC firms | N<br>p = 0.889<br>and 0.830 | N<br>p = 0.745<br>and 0.881 | N<br>p = 0.939<br>and 0.959 | N<br>p = 0.335<br>and 0.617 | N | N |
| Null rejected for MC firms | a | N<br>p = 0.930<br>and 0.927 | N<br>p = 0.438<br>and 0.281 | N<br>p = 0.175<br>and 0.481 | N | N |
| H3 supported | N | N | N | N | N | N |

Y means that the null hypothesis can be rejected, N means that the null hypothesis cannot be rejected, P means that the null hypothesis partially can be rejected and p referred to the p-valve. a means that the analysis was not possible.

SIZE, is used as a proxy for political visibility. Contrary to prediction, the total value of sales (SALES) coefficient was positive and significantly associated with management's choice of income increasing depreciation method among the database firms (at the 5% level) and in the questionnaire survey (at the 10% level). An alternative proxy for political costs, the total value of assets (ASSETS), is also positively significantly associated with management's choice of income increasing depreciation method across the database at 5% level of significance but is not significant for the questionnaire survey. The SALES variable is positively and significantly associated with management's choice of income increasing inventory valuation method for the questionnaire survey but not for the database. However, the ASSETS variable is not statistically significantly associated with management's choice of income increasing inventory valuation method in either across questionnaire survey or the database. Also, the results lend no support for either $H3_{Oa}$ or $H3_{Ma}$ that a relationship exists between size of owner and manager-controlled firms and their depreciation choice. Similarly, contrary to what has been hypothesised ($H3_{Ob}$), the total value of sales (ASSETS) is positive and significantly associated with management's choice of income increasing inventory method for owner-controlled firms in the survey at the 5% level and the total value of assets (SALES) at the 10% level. On the other hand, such relationships are not found for owner-controlled firms in the database. Also, the results lend no support for $H3_{Mb}$ that there is a relationship between size of manager-controlled firms and their inventory valuation methods either across the questionnaire survey or the database.

Overall, the univariate results of the SIZE variable show a significant positive relationship with the firm's decision to use SLD for the firms included in the database which is less significant for the survey companies. Only one of the four tests relating to

FIFO was statistically significant and that showed a positive rather than negative relationship. The results do not support the hypothesis that managers of larger firms are less likely than those of smaller firms to adopt income–increasing accounting choices ($H3_a$ and $H3_b$).

BETA, which is a control variable and a proxy for systematic risks is negatively associated with management's choice of income increasing inventory valuation method at 5% level but is not associated with management's choice of the income increasing depreciation method. No other coefficients for the control variables appear to be significantly associated with firms' depreciation policy decisions or choices of inventory valuation methods.

In summary, the univariate analyses results provide strong support for the bonus plans hypothesis ($H1_a$, $H1_{Oa}$, $H1_{Ma}$ and $H1_b$ and $H1_{Ob}$). In addition, the results are consistent with hypotheses $H2_a$ and $H2_{Oa}$ concerning the association between leverage and depreciation method but not for the hypothesis concerning the association between leverage and inventory valuation method ($H2_b$). The univariate analysis provides no support for the hypotheses relating to political costs (H3, $H3_O$ and $H3_M$). Whereas previous studies hypothesized a negative relationship between the firm's size and the firm's choice of SLD (e.g., Wang, 1988; Cahan, 1992), the data in the current research shows a positive association between the firm's size and its use of that method.

On the basis of the findings of the univariate statistical analysis, some basic conclusions can be arrived at with respect to the research questions being raised in the present study. The management incentive plans were significantly related to the accounting choices whether this choice related to depreciation or inventory valuation methods. Moreover, the level of leverage was significantly related to the depreciation accounting choices. These observations are largely consistent with the findings of

earlier studies using univariate analysis. A multivariate analysis provides the possibility of more detailed insights suggesting which associations are direct and which indirect. The next section provides such an analysis for the survey and the database.

## 7.3 Multivariate analysis

The objective of univariate analyses of individual variables was to examine the empirical validity of predictions relating to particular economic motives. Such analyses were unable to assess how much of the total variation in management's accounting method choice is explained by each of the economic motives considered in the current study. Multivariate analysis is able to identify relationships in more detail and to suggest which relationships may be direct and which may be indirect. The empirical analysis was conducted in a cross–sectional framework using SPSS software for multivariate analysis. It aimed to identify the contribution of all of the variables to explaining the depreciation and the inventory valuation policy decisions of firms using the logistic models (1) and (2) that were described in Chapter 5. Logistic regression analysis is appropriate because each of the dependent variables of interest can take one of only two values (see Chapter 5). In this study the choice of depreciation policy is reduced to use of SLD method or not, and the choice of inventory valuation policy to use of FIFO or of some other method. The multivariate analysis provides estimates of how much of the variation in accounting method choice might be explained by the proxies for management's economic motives. The emphasis in these multivariate analyses is on the regressions of each of the accounting method choice variables on various groups of proxies. The logistic regression analysis proceeded in two stages. Throughout the first stage, the incremental tests were conducted to examine the contribution of each independent variable in explaining the dependent variable using

the models developed for the purpose of the study. Throughout the second stage. the logistic regression analysis was conducted to indicate the cumulative explanatory power of the identified variables. Before starting the logistic regression analysis. it is helpful to examine the multicollinearity in the logistic model. The results of the analysis for each dependent variable are presented below both for the questionnaire survey and for the database firms.

### 7.3.1 Multicollinearity in the logistic model

The strong correlation between SALES and ASSETS (Kendall's tau–b = 0.722 in the survey and 0.532 in the database) reveals the possibility that multi–collinearity may exist between these explanatory variables. No collinearity diagnostics are available from logistic regression in SPSS. However, since collinearity is solely a function of the independent variables, one could use linear regression to determine the extent to which collinearity is present (see SAS/STAT User's Guide, p. 1416-1418). Thus, one dependent 'Y' variable was supplied and the same independent variables on the regression models statement that developed in the logistic model were tested. Ideally, the variance inflation factor (VIF) for each independent variable should be 1 (this would happen when variables in the model are orthogonal). Values of VIF exceeding 5 are often regarded as indicating multicollinearity, but in a weaker model, which is often the case in logistic regression, values above 2.5 may be a cause for concern (see Allison, 1999). Table 7-13 shows that the VIF for SALES and ASSETS variables are 2.452 and 2.517 respectively for survey firms as well as 2.142 and 2.356 respectively for database firms. Thus, the standard error of the coefficient of the ASSETS variable for survey is larger than it would have been with in the absence of multicollinearity (values above 2.5) as well as the standard error of the coefficient of ASSETS variable

for the database is very close to 2.5. Since both SALES and ASSETS variables were used as alternative proxies for political costs, one of these two variables can be dropped from the analysis.

**Table 7-13 Collinearity statistics**

| Variable | Survey | | Database | |
|---|---|---|---|---|
| | Tolerance | VIF | Tolerance | VIF |
| MP | 0.729 | 1.371 | 0.851 | 1.175 |
| LEV | 0.894 | 1.118 | 0.611 | 1.638 |
| LEV1 | - | - | 0.660 | 1.514 |
| SALES | 0.408 | 2.452 | 0.467 | 2.142 |
| ASSETS | 0.397 | 2.517 | 0.424 | 2.356 |
| TAXRATE | 0.763 | 1.310 | 0.478 | 2.092 |
| BETA | - | - | 0.630 | 1.587 |
| CI | - | - | 0.637 | 1.570 |
| CR | - | - | 0.881 | 1.135 |
| PROFIT | - | - | 0.459 | 2.176 |

Tolerance = 1 / VIF. These results are from an OLS regression of y-variable depreciation on all independent and control variables.

### 7.3.2. Incremental tests

To test the hypothesis that all $\beta$'s = 0 versus the alternative that at least one did not, one can use an overall chi-squared statistic; on the improvement obtained by fitting a model with all the independent variables. To test the hypothesis that each $\beta = 0$ versus the alternative that it does not, one can use an incremental chi-squared statistic; on the improvement obtained when the corresponding independent variable is added to the model[170]. Sequences of logistic regression models were therefore fitted to the survey data and to the database data with the dependent variables (a) choice of depreciation method and (b) choice of inventory valuation method.

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[170] Unfortunately, the improvement achieved by adding a particular variable to the model depends on which other variables are already present.

### *7.3.2.1 Firms' decisions regarding depreciation method choices*

Table 7-14 presents the results of the tests to estimate the individual contribution of each variable in explaining the variation in the depreciation choice for the survey companies (i) for all firms (panel A) and (ii) for owner-controlled firms (panel B)[171].

Firstly, for all firms in the survey (see panel A of Table 7-14), only the variable MP significantly contributes to explaining the variation in the depreciation variable. The results indicate that the particular variable MP reduces the value of the *–2LL* to 68.270 from 94.173, while the level of significance for the improvement from a chi-squared distribution with one degree of freedom is 0.000. Moreover, the sign of the coefficient for the particular variable MP matches the prediction made in Chapter 5. The results are consistent with the hypothesis ($H1_a$) that managers of firms with bonus plans are more likely to choose SLD. None of the other coefficients in Model (1) are statistically significant. The p-values for the reported contributions of the other variables (LEV and SALES) are well above 0.05.

Secondly, behaviour similar to that shown in panel A of Table 7-14 can be seen in panel B of Table 7-14 that refers to owner-controlled firms in the survey. The results indicate that the particular variable MP reduces the value of the *–2LL* ratio to 62.992 from 74.920; the level of significance of the observed improvement in *–2LL* is 0.001. The sign of the coefficient for the MP variable is positive as predicted in Chapter 5. The result of the MP variable is consistent with the hypothesis ($H1_{Oa}$) that managers of owner-controlled firms with bonus plans are more likely to choose SLD. The p-values

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[171] Since all manager-controlled firms in the survey used SLD, the sub-analysis for such firms was dropped. To split the file the dependent variable has to have more than two non-missing values. For logistic regression, the dependent value must assume exactly two values on the cases being processed.

for the observed improvement (block chi-squared) for the other variables (0.149 and 0.788) are far from the significance level of 0.05.

**Table 7-14 Individual contribution of each variable for the depreciation choices for survey**

| **Panel A: All firms (N = 93)** | | | | | | |
|---|---|---|---|---|---|---|
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0 | Constant | – | 94.173 | – | – | – |
| 1 | Model 0 + MP | 3.374 | 68.270 | 25.903 | 1 | 0.000** |
| 2 | Model 1 + LEV | 1.252 | 66.622 | 1.647 | 1 | 0.199 |
| 3 | Model 2 + SALES[172] | -0.683 | 66.147 | 0.475 | 1 | 0.491 |
| **Panel B: OC firms (N = 60)** | | | | | | |
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0 | Constant | – | 74.920 | – | – | – |
| 1 | Model 0 + MP | 2.555 | 62.992 | 11.928 | 1 | 0.001* |
| 2 | Model 1 + LEV | 1.400 | 60.908 | 2.084 | 1 | 0.149 |
| 3 | Model 2 + SALES | -0.269 | 60.835 | 0.073 | 1 | 0.788 |
| **Panel C: MC firms (N = 33)** | | | | | | |
| The analysis was not possible. Since there are no cases the split file MC was skipped. For split file MC, the dependent variable has fewer than two non-missing values. For logistic regression, the dependent value must assume exactly two values on the cases being processed. | | | | | | |

*Significant at the level 0.05, against a one–sided alternative and **significant at the level 0.01, against a one–sided alternative. MP denotes the existence of management bonus plans based on accounting figures, OC denotes owner-controlled firms, LEV referred to total debt divided by total assets and SALES referred to total sales.

Table 7-15 presents the results of the tests to estimate the individual contribution of each variable[173] in explaining the variation in the depreciation choice for the database companies (i) for all firms (panel A), (ii) for owner-controlled firms (panel B) and (iii) for manager-controlled firms (panel C).

Firstly, for all firms in the database (see panel A of Table 7-15), the variable MP contributes significantly to explaining the variation in the depreciation choice variable.

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[172] Since the standard error of the coefficient of ASSETS variable for survey is larger than it would have been with in the absence of multicollinearity (see Table 7-13) this variable was dropped from the analysis.

[173] For the database companies, information was available on a number of further variables that were not investigated in the survey.

The results indicate that this variable generates the greatest and the most significant reduction in the *–2LL* ratio. The MP variable reduces the value of the *–2LL* to 43.065 from 63.255, while the level of significance is 0.000. In addition, the variable LEV1 contributes significantly to explaining the variation in the depreciation variable. The particular variable LEV1 reduces the value of the *–2LL* ratio to 37.981 from 43.065; the associated p-value is 0.024. Further, the CR variable contributes significantly to explaining the variation in the depreciation variable; this variable generates an improvement of 4.949 in the *–2LL* ratio; with a p-value of 0.026. Moreover, the sign of the coefficients for the particular variables MP, LEV1 and CR match the predictions made in Chapter 5. The result for the MP variable is consistent with the hypothesis ($H1_a$) that managers of firms with bonus plans are more likely to choose SLD. Moreover, the result of LEV1 variable is consistent with the hypothesis ($H2_a$) that the higher the leverage, the greater the likelihood that a firm will choose the SLD method. None of the other coefficients in Model (1) are statistically significant.

Secondly, for owner-controlled firms in the database (see panel B of Table 7-15), the results indicate that the PROFIT variable generates the greatest and the most significant reduction of 13.556 in the *–2LL* ratio; the p-value is 0.000. In addition, the variables of LEV1, CR and CI significantly contribute to explaining the variation in the depreciation variable. The particular variable LEV1 reduces the value of the *–2LL* ratio to 28.468 from 32.762; p-value is 0.038. Further, variables CI and CR reduce the value of the *–2LL* ratio to 22.335 from 27.871 and to 13.556 from 22.335 respectively; with p-values 0.019 and 0.003 respectively. The sign of the coefficients for the particular variables PROFIT, LEV1, CI and CR match the predictions made in Chapter 5. The result for the LEV1 variable is consistent with hypothesis $H2_{Oa}$ that the higher the

leverage, the greater the likelihood that an owner-controlled firm will choose the SLD method.

**Table 7-15 Individual contribution of each variable for the depreciation choices for database**

| Panel A: All firms (N = 96) | | | | | | |
|---|---|---|---|---|---|---|
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0 | Constant | – | 63.255 | – | – | – |
| 1 | Model 0 + MP | 3.316 | 43.065 | 20.19 | 1 | 0.000** |
| 2 | Model 1+ LEV1 | 1.684 | 37.981 | 5.085 | 1 | 0.024* |
| 3 | Model 2+ ASSETS | 0.316 | 37.878 | 0.103 | 1 | 0.749 |
| 4 | Model 3+ BETA | -1.506 | 36.149 | 1.729 | 1 | 0.188 |
| 5 | Model 4 + CI | -1.567 | 33.866 | 2.282 | 1 | 0.131 |
| 6 | Model 5 + CR | -1.845 | 28.917 | 4.949 | 1 | 0.026* |
| 7 | Model 6 + PROFIT | -0.731 | 28.375 | 0.541 | 1 | 0.462 |
| **Panel B: OC firms (N = 31)** | | | | | | |
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0 | Constant | – | 34.162 | – | – | – |
| 1 | Model 0 + MP | 1.075 | 32.762 | 1.400 | 1 | 0.237 |
| 2 | Model 1+ LEV1 | 1.518 | 28.468 | 4.294 | 1 | 0.038* |
| 3 | Model 2+ ASSETS | 0.125 | 28.453 | 0.015 | 1 | 0.903 |
| 4 | Model 3+ BETA | -0.845 | 27.871 | 0.582 | 1 | 0.446 |
| 5 | Model 4 + CI | -1.955 | 22.335 | 5.536 | 1 | 0.019* |
| 6 | Model 5 + CR | -1.942 | 13.556 | 8.779 | 1 | 0.003** |
| 7 | Model 6 + PROFIT | -0.017 | 0 | 13.556 | 1 | 0.000** |
| **Panel C: MC firms (N = 65)** | | | | | | |
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0 | Constant | – | 17.736 | – | – | – |
| 1 | Model 0 + MP | 0.138 | 5.545 | 12.191 | 1 | 0.000** |
| 2 | Model 1+ LEV1 | 0.778 | 4.742 | 0.803 | 1 | 0.370 |
| 3 | Model 2+ ASSETS | 0.621 | 4.153 | 0.589 | 1 | 0.443 |
| 4 | Model 3+ BETA | -0.008 | 0.000 | 4.153 | 1 | 0.042* |

*Significant at the level 0.05, against a one–sided alternative and **significant at the level 0.01, against a one–sided alternative. MP denotes management bonus schemes, OC denotes owner-controlled firms and MC denotes manager-controlled firms, ASSETS referred to the total assets, LEV1 referred to long-term debt divided by total equity, BETA was computed using the daily returns around December 31, 2000 and a value weighted market index; it was obtained from the CMA in Cairo, CI was the fixed assets divided by total sales, CR was measured by eight–firms concentration ratios for industries (percentage of sales) and PROFIT was measured as earnings before interest and taxes for the financial year divided by the book value of assets.

Thirdly, for manager-controlled firms in the database (see panel C of Table 7-15), the MP variable generates the greatest and the most significant reduction in the *–2LL*.

The particular variable MP reduces the value of the *–2LL* ratio to 5.545 from 17.736, and the level of significance associated with this change is 0.000. In addition, the BETA variable contributes significantly to explaining the variation in the depreciation variable; the p-value for the observed improvement in *–2LL* is 0.042. The sign of the coefficients for the particular variables MP and BETA are in line with those reported in Chapter 5. The result for the MP variable is consistent with hypothesis $H1_{Ma}$ that managers of manager-controlled firms with bonus plans are more likely to choose SLD. The remaining variables, CI, CR, PROFIT were not included in the list of models because their contributions were almost zero.

#### *7.3.2.2 Firms' decisions regarding inventory method choices*

Table 7-16 presents the individual contribution of each variable in explaining the variation in the inventory choice for the survey companies (i) for the total sample (panel A), (ii) for owner-controlled firms (panel B) and (iii) for manager-controlled firms (panel C). A number of points emerge from this analysis.

Firstly, for all firms that responded to the survey (see panel A of Table 7-16), the results reported indicate that only the MP variable significantly improved the modelling of the inventory variable. In particular, the MP variable reduces the value of the *–2LL* to 116.932 from 127.102, and this improvement has a level of significance of 0.001. The sign of the coefficient for the MP variable matches the prediction made in Chapter 5. The result for the MP variable is consistent with hypothesis $H1_b$ that managers of firms with bonus plans are more likely to choose the FIFO inventory method. None of the other coefficients in Model (2) significantly improve the prediction of the inventory variable.

**Table 7-16 Individual contribution of each variable for the inventory choices for survey**

| Panel A: All firms (N = 93) | | | | | | |
|---|---|---|---|---|---|---|
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0. | Constant | - | 127.102 | - | - | - |
| 1. | Model 0 + MP | 3.077 | 116.932 | 10.171 | 1 | 0.001** |
| 2. | Model 1 + LEV | 1.000 | 115.917 | 1.015 | 1 | 0.314 |
| 3. | Model 2+ SALES | 0.567 | 115.597 | 0.32 | 1 | 0.572 |
| 4. | Model 3+ TAXRATE | 0.499 | 115.348 | 0.249 | 1 | 0.618 |
| **Panel B: OC firms (N = 60)** | | | | | | |
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0. | Constant | | 73.304 | | | |
| 1. | Model 0 + MP | 2.322 | 67.758 | 5.546 | 1 | 0.019* |
| 2. | Model 1 + LEV | 0.535 | 67.471 | 0.287 | 1 | 0.592 |
| 3. | Model 2+ SALES | 0.61 | 67.093 | 0.378 | 1 | 0.539 |
| 4. | Model 3+ TAXRATE | -0.324 | 66.986 | 0.107 | 1 | 0.744 |
| **Panel C: MC firms (N = 33)** | | | | | | |
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0. | Constant | | 42.010 | | | |
| 1. | Model 0 + MP | -0.219 | 39.431 | 2.579 | 1 | 0.108 |
| 2. | Model 1 + LEV | 1.403 | 37.179 | 2.252 | 1 | 0.133 |
| 3. | Model 2+ SALES | 1.333 | 35.257 | 1.922 | 1 | 0.166 |
| 4. | Model 3+ TAXRATE | 1.838 | 31.304 | 3.953 | 1 | 0.047* |

*Significant at the level 0.05, against a one–sided alternative and **significant at the level 0.01, against a one–sided alternative. TAXRATE was measured as tax expense divided by net income. The abbreviations defined in table 7-14 continue to apply for the remaining variables.

Secondly, for owner-controlled firms in the survey (see panel B of Table 7-16), the results indicate that only the MP variable generates a significant reduction of the *–2LL*. The value of the improvement in the *–2LL* is 5.546; the p-value is 0.019. The sign of the coefficient for the MP variable is positive as predicted in Chapter 5. The result for the MP variable is consistent with hypothesis $H1_{Ob}$ that, managers of owner-controlled firms with bonus plans are more likely to choose the FIFO inventory method. For owner–controlled firms in the survey, none of the other coefficients in Model (2) are statistically significant in explaining the variation in the inventory choice. Thirdly, for manager-controlled firms in the database (see panel C of Table 7-

16), only the TAXRATE variable significantly improved the prediction of the inventory choice variable. It reduces the value of the *–2LL* to 31.304 from 35.257, and the level of significance associated with this improvement was 0.047. The sign of the coefficient for the particular variable TAXRATE does not match the prediction made in Chapter 5. None of the other coefficients in Model (2) are statistically significant.

Table 7-17 presents the individual contribution of each variable in explaining the variation in the inventory choice for the database firms (i) for all firms (panel A), (ii) for owner-controlled firms (panel B) and (iii) for manager-controlled firms (panel C).

An inspection of this table reveals that for all firms in the database (see panel A of Table 7-17), the variable MP significantly reduces the value of *–2LL* to 86.374 from 93.713, while the level of significance is 0.007. The sign of the coefficient for the MP variable is positive which matches the prediction made in Chapter 5. The result for the MP variable is consistent with hypothesis $H1_b$ that managers of firms with bonus plans are more likely to choose the FIFO inventory method. In addition, the BETA variable contributes significantly to explaining the variation in the inventory variable; this variable generates a significant reduction of the *–2LL* to 77.732 from 83.419; with a p-value of 0.017. The sign of the coefficient for this particular BETA variable is negative which matches the prediction made in Chapter 5. None of the other coefficients in Model (2) are statistically significant.

For owner-controlled firms in the database, panel B of Table 7-17 indicates that the variables MP, BETA and CR generate significant reductions of the *–2LL* ratio. The MP variable improves the *–2LL* ratio by 7.531; with a p-value 0.006. The sign of the coefficient for this MP variable is positive as predicted in Chapter 5. The result for the MP variable is consistent with hypothesis $H1_{Ob}$ that, managers of owner–controlled

firms with bonus plans are more likely to choose the FIFO inventory method. Furthermore, the variables of BETA and CR contribute significantly to explaining the variation in the inventory variable for owner–controlled firms.

**Table 7-17 Individual contribution of each variable for the inventory choices for database**

| **Panel A: All firms (N = 96)** | | | | | | |
|---|---|---|---|---|---|---|
| Model | | B/S.E. | -2 LL | Improvement | df. | Sig. |
| 0 | Constant | - | 93.713 | - | - | - |
| 1 | Model 0 + MP | 2.060 | 86.374 | 7.339 | 1 | 0.007** |
| 2 | Model 1+ LEV1 | 1.508 | 84.140 | 2.234 | 1 | 0.135 |
| 3 | Model 2+ ASSETS | -0.830 | 83.419 | 0.721 | 1 | 0.396 |
| 4 | Model 3+ BETA | -2.020 | 77.732 | 5.687 | 1 | 0.017* |
| 5 | Model 4 + CI | 0.508 | 77.491 | 0.241 | 1 | 0.623 |
| 6 | Model 5 + CR | 0.649 | 77.074 | 0.418 | 1 | 0.518 |
| 7 | Model 6 + PROFIT | -0.695 | 76.585 | 0.489 | 1 | 0.484 |
| 8 | Model 7+TAXRATE | 0.420 | 76.411 | 0.174 | 1 | 0.677 |
| **Panel B: OC firms (N = 31)** | | | | | | |
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0 | Constant | - | 26.662 | - | - | - |
| 1 | Model 0 + MP | 2.406 | 19.131 | 7.531 | 1 | 0.006** |
| 2 | Model 1+ LEV | 1.075 | 17.788 | 1.343 | 1 | 0.247 |
| 3 | Model 2+ ASSETS | -0.264 | 17.718 | 0.07 | 1 | 0.791 |
| 4 | Model 3+ BETA | -1.497 | 9.967 | 7.751 | 1 | 0.005** |
| 5 | Model 4 + CI | 0.884 | 9.356 | 0.611 | 1 | 0.434 |
| 6 | Model 5 + CR | 0.036 | 0.000 | 9.356 | 1 | 0.002** |
| **Panel C: MC firms (N = 65)** | | | | | | |
| Model | | B/S.E. | *–2LL* | Improvement | df. | Sig. |
| 0 | Constant | - | 66.743 | - | - | - |
| 1 | Model 0 + MP | 0.233 | 64.658 | 2.085 | 1 | 0.149 |
| 2 | Model 1+ LEV1 | -1.500 | 62.282 | 2.375 | 1 | 0.123 |
| 3 | Model 2+ ASSETS | -0.291 | 62.197 | 0.086 | 1 | 0.769 |
| 4 | Model 3+ BETA | -0.525 | 61.918 | 0.279 | 1 | 0.597 |
| 5 | Model 4 + CI | 0.145 | 61.898 | 0.02 | 1 | 0.888 |
| 6 | Model 5 + CR | 0.033 | 61.897 | 0.001 | 1 | 0.975 |
| 7 | Model 6 + PROFIT | -0.920 | 61.029 | 0.868 | 1 | 0.352 |
| 8 | Model 7+TAXRATE | 0.958 | 60.123 | 0.906 | 1 | 0.341 |

*Significant at the level 0.05, against a one–sided alternative and **significant at the level 0.01, against a one–sided alternative. TAXRATE was measured as tax expense divided by net income. The abbreviations defined in table 7-15 continue to apply for the variables.

The BETA variable reduces the value of the *–2LL* ratio to 9.967 from 17.718; (p-value 0.005) while the CR variable improves the *–2LL* ratio by 9.356; the level of significance of the observed improvement (block chi-square) is 0.002. The sign of the coefficient for the BETA variable matches the prediction made in Chapter 5. None of the other coefficients in Model (2) are statistically significant for owner-controlled firms in the database in explaining the variation in the inventory choice.

Finally, panel C of Table 7-17 reveals that for manager-controlled firms in the database, none of the variables significantly improve the modelling of the variation in the inventory variable. The p-values for the observed improvement in the *-2LL* for all of the variables presented in panel C of Table 7-17 are well above the significance level of 0.05.

### 7.3.3. The logistic regression analysis

#### *7.3.3.1 Logistic regression analysis for depreciation method choice*

The results of the logistic regression analysis for the firms' depreciation choice for the questionnaire survey and database are presented in Tables 7-18 and 7-19. The logistic model (1) used to analyse the choice of depreciation method for the survey data. It includes 3 explanatory variables (MP, LEV and SALES). MP is an indicator variable, taking values 0 or 1, whereas LEV and SALES are categorical variables with 5 levels[174]. To obtain a clearer picture by removing some explanatory variables that are either insignificant or highly correlated with others and to identify a model in which most of the variables have significant coefficients, a "backward elimination" search was conducted. The overall goodness of fit of the model was then assessed using the

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[174] The intervals underlying the 5 levels were chosen to represent each variable on an approximately logarithmic scale. For that reason, and in order to arrive at a monotonic relationship with the dependent variable these categorical variables have been used as if they were interval valued explanatory variables.

deviance, which is twice the reduction in the log–likelihood compared to the maximal model[175]. A combined test of the model coefficients was performed using the improvement in log–likelihood[176]. The ability of the fitted model to explain the choice of method from the independent variables was measured by the percentage correctly identified by the fitted model[177]. The significance of the individual parameter estimates for the independent variables was assessed by treating the ratio of parameter estimate to its standard error as a standard normal deviate[178]. For the regression coefficients, the p–value shown is the probability of a standard normal deviate taking a value further than the observed ratio in the direction predicted by the alternative hypothesis. This process takes account of the predicted sign of the coefficient. Table 7-18 presents the results of the logistic regression analysis for the survey firms' depreciation choice (i) for all firms (panel A) and (ii) for owner-controlled firms (panel B)[179].

When all the firms in the survey are included, (see panel A of Table 7-18) MP has a statistically significant part to play in predicting the choice of depreciation policy by those firms that responded to the questionnaire (B/S.E. statistic = 3.374 with a p–value of 0.0004). None of the other variables have coefficients that are statistically significant. The *-2LL* shows that the model does provide an improved explanation of

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[175] The maximal model has as many parameters as observations and hence provides the best possible fit to the model. Large values of this statistic indicate a poor fit.

[176] The omnibus test of model coefficients compares the fit of the model in question with that of the first model, with a single parameter. Large values of this statistic indicate a significant improvement in fit.

[177] The overall percentage correct compares the observed frequencies with the fitted group frequencies, using a cut–off point to assign an observation to a group [0 or 1] depending on its estimated probability of group membership.

[178] SPSS provides the Wald statistic, which is the square of the ratio of parameter estimate to its standard error. The Wald statistic is not appropriate when the alternative hypothesis is one–sided, as it destroys the information on the sign of the parameter estimate.

the variability in choice of depreciation method by firms that responded to the questionnaire. The combined test of the model coefficients reveals that the improvement in fit due to including only one variable in the model is highly significant (p–value = 0.000).

**Table 7-18 Logistic regression y–variable depreciation choice for the survey**

| **Panel A: All firms (N = 93)** | | | | | |
|---|---|---|---|---|---|
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 3.562 | 1.056 | 3.374 | 1 | 0.0004*** |
| Constant | 0.329 | 0.309 | 1.063 | 0 | 0.2879 |
| ***Significant at the level 0.001, against a one–sided alternative. Model Goodness of Fit *-2LL* = 68.270. Omnibus test of model coefficients chi–squared = 25.903, p–value = 0.000. Overall percentage correctly predicted group membership is 79.6. | | | | | |
| **Panel B: OC firms (N = 60)** | | | | | |
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 2.742 | 1.073 | 2.555 | 1 | 0.005** |
| Constant | 0.201 | 0.318 | 0.631 | 0 | 0.528 |
| **Significant at the level 0.01, against a one–sided alternative. Model Goodness of Fit *-2LL* = 62.992. Omnibus test of model coefficients chi–squared = 11.928, p–value = 0.001. Overall percentage correctly predicted group membership is 68.3. | | | | | |
| **Panel C: MC firms (N = 33)** | | | | | |
| The analysis was not possible. Since there are no cases the split file MC was skipped. For split file MC, the dependent variable has fewer than two non-missing values. For logistic regression, the dependent value must assume exactly two values on the cases being processed. | | | | | |

MP denotes management bonus schemes, OC denotes owner-controlled firms and MC denotes manager-controlled firms.

Behaviour similar to that shown in panel A of Table 7-18 can be seen in panel B of the same Table which refers to owner-controlled firms in the survey. MP has a statistically significant part to play in explaining the choice of depreciation policy by those firms that responded to the questionnaire (B/S.E. statistic = 2.555 with a p–value of 0.005). None of the other variables have coefficients that are statistically significant. The *-2LL* shows that the model does provide an improved explanation of the variability

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[179] Here, once again, all manager-controlled firms used SLD, thus, the sub-analysis for such firms was dropped.

in choice of depreciation method by firms that responded to the questionnaire and the model is highly significant (p–value = 0.001). The overall percentage correct was 68.3 which is relatively poor.

Table 7-19 presents the results of the logistic regression analysis for the firms' depreciation choice for the database firms (i) for all firms (panel A), (ii) for owner-controlled firms (panel B) and for manager-controlled firms (panel C). The logistic model used for choice of depreciation method includes 8 explanatory variables (MP, LEV, LEV1, ASSETS, BETA, CI, CR and PROFIT). A "backward elimination" search was also conducted to create the best model.

For all firms in the database, an analysis of panel A of Table 7-19 indicates that four variables (MP, LEV1, CI and CR) are statistically significant. The signs taken by their parameter estimates match the predictions made in Chapter 5. The variable MP emerges as the most statistically significant (p–value = 0.001). There are three further variables (LEV1, CI and CR) that are statistically significant at the 5% level. None of the other variables in model (1) are statistically significant. Although it has fewer parameters, the 4–variable model outlined in the table is highly significant (p–value = 0.000).

An inspection of the results for the owner-controlled firms in the database (see panel B of Table 7-19) highlights that the variables MP, LEV, LEV1, and CR are statistically significant; they provide an adequate explanation of the variability in choice of depreciation method by owner–controlled firms that are in the database. The signs taken by their parameter estimates match the predictions made in Chapter 5 and are significant at the 5% level. The model is highly significant (p–value = 0.001).

Finally, for manager-controlled firms in the database (see panel C of Table 7-19), none of the variables provide a significant contribution to the explanation of the

variability in choice of depreciation method. But the model is highly significant, of the chi–squared is 72.246 with a p–value of 0.000.

**Table 7-19 Logistic regression y–variable depreciation choice for the database**

| **Panel A: All firms (N = 96)** | | | | | |
|---|---|---|---|---|---|
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 5.914 | 1.867 | 3.167 | 1 | 0.001** |
| LEV1 | 0.055 | 0.024 | 2.302 | 1 | 0.011* |
| CI | -0.333 | 0.192 | -1.735 | -1 | 0.041* |
| CR | -4.904 | 2.676 | -1.833 | -1 | 0.033* |
| Constant | 1.172 | 0.939 | 1.248 | 0 | 0.212 |
| *Significant at the level 0.05, against a one–sided alternative and **significant at the level 0.01, against a one–sided alternative. Model Goodness of Fit *-2LL* = 30.865. Omnibus test of model coefficients chi–squared = 32.390, p–value = 0.000. Overall percentage correctly predicted group membership is 92.4. | | | | | |
| **Panel B: OC firms (N = 31)** | | | | | |
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 4.012 | 2.428 | 1.652 | 1 | 0.049* |
| LEV | 0.084 | 0.048 | 1.728 | 1 | 0.042* |
| LEV1 | 0.040 | 0.024 | 1.662 | 1 | 0.048* |
| CR | -7.275 | 3.916 | -1.858 | -1 | 0.032* |
| Constant | -2.629 | 2.499 | -1.052 | 0 | 0.293 |
| *Significant at the level 0.05, against a one–sided alternative. Model Goodness of Fit *-2LL* = 19.216. Omnibus test of model coefficients chi–squared = 18.135, p–value = 0.001. Overall percentage correctly predicted group membership is 90.3. | | | | | |
| **Panel C: MC firms (N = 65)** | | | | | |
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| Constant | 3.45 | 0.72 | 4.803 | 0 | 0.000 |
| Model Goodness of Fit *-2LL* = 17.863. Omnibus test of model coefficients chi–squared = 72.246, p–value = 0.000. Overall percentage correctly predicted group membership is 96.9. | | | | | |

The abbreviations defined in table 7-14 continue to apply for the variables.

Overall, several noteworthy points emerge from comparing the analyses for the questionnaire survey and database firms. First, when the results for the variables those are available in both questionnaire and database are considered, as expected the coefficient of MP is positive and statistically significant both for all firms and for owner-controlled firms. Second, an analysis of the results that only are available for the database variables indicate that LEV1 and CR are significant for all firms and for

owner-controlled firms but not for manager-controlled firms. In addition. CI and PROFIT are significant for owner-controlled firms. Third, the variable LEV that features in both datasets is significant for owner-controlled firms but only in the database and not in the survey. Finally, the chosen models provide a better fit for the database than for the questionnaire. This could be because the model has more variables for the database than survey.

### *7.3.3.2 Logistic regression analysis of the choice of inventory method*

Separate logistic regression analyses of the firms' choice of inventory valuation method were also carried for the questionnaire survey and the database. The results of these analyses are presented in Tables 7-20 and 7-21. For the survey data, the logistic model (2) used for choice of inventory valuation method includes the 4 explanatory variables (MP, LEV, ASSETS and TAXRATE). A "backward elimination" search was conducted to identify the best model. A number of findings emerge.

Firstly, for all survey firms (see panel A of Table 7-20), the results suggest that MP has a statistically significant part to play in predicting the choice of inventory policy by those firms that responded to the questionnaire (B/S.E. statistic is 3.077 with a p–value of 0.001). None of the other variables have coefficients that are statistically significant. The combined test of the model coefficients reveals that the improvement in fit due to including only one variable in the model is highly significant (p–value is 0.001). The overall percentage correct was 65.6.

Secondly, similar behaviour to that shown in panel A of Table 7-20 can be seen in panel B of Table 7-20 that refers to owner-controlled firms in the survey. Again, MP has a statistically significant part to play in predicting the choice of depreciation policy by those firms that responded to the questionnaire, (the B/S.E. statistic is 2.323 with a

p–value of 0.010). None of the other variables have coefficients that are statistically significant. The *–2LL* shows that the model does provide an improved explanation of the variability in choice of depreciation method by firms that responded to the questionnaire and the model is highly significant (p–value is 0.001). In contrast, for manager-controlled firms in the survey (see panel C of Table 7-20), only the variable LEV provides a significant contribution to the explanation of the variability in choice of inventory method.

**Table 7-20 Logistic regression y–variable Inventory method for the survey**

| **Panel A: All firms (N = 93)** | | | | | |
|---|---|---|---|---|---|
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 1.391 | 0.452 | 3.077 | 1 | 0.001** |
| Constant | -1.068 | 0.350 | -3.055 | 0 | 0.002** |
| **Significant at the level 0.01, against a one–sided alternative. Model Goodness of Fit *-2LL* = 116.932. Omnibus test of model coefficients chi–squared = 10.171, p–value = 0.001. Overall percentage correctly predicted group membership is 65.6. | | | | | |
| **Panel B: OC firms (N = 60)** | | | | | |
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 1.386 | 0.597 | 2.323 | 1 | 0.010* |
| Constant | -1.386 | 0.395 | -3.507 | 0 | 0.0005** |
| **Significant at the level 0.01, against a one–sided alternative. Model Goodness of Fit *-2LL* = 62.992. Omnibus test of model coefficients chi–squared = 11.928, p–value = 0.001. Overall percentage correctly predicted group membership is 68.3. | | | | | |
| **Panel C: MC firms (N = 33)** | | | | | |
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | -12.64 | 46.96 | -0.269 | 1 | 0.606 |
| LEV | 1.03 | 0.54 | 1.901 | 1 | 0.029* |
| SALES | 0.82 | 0.42 | 1.972 | -1 | 0.976 |
| TAXRATE | 0.84 | 0.46 | 1.838 | -1 | 0.967 |
| Constant | 4.53 | 46.94 | 0.096 | 0 | 0.923 |
| *Significant at the level 0.05, against a one–sided alternative. Model Goodness of Fit *-2LL* = 31.304. Omnibus test of model coefficients chi–squared = 10.706, p–value = 0.030. Overall percentage correctly predicted group membership is 75.8. | | | | | |

The abbreviations defined in table 7-16 continue to apply for the variables.

Model (2) also provided the basis of the regression estimations for inventory valuation method choices that are summarised in Table 7-21; this table shows the

results of the analysis of the choice of inventory valuation method for the database companies (i) for all firms (panel A), (ii) for owner-controlled firms (panel B) and for manager-controlled firms (panel C). A "backward elimination" search was conducted to create the best model.

Panel A of Table 7-21 reveals that, as predicted, the coefficients of MP and LEV1 are positive and statistically significant (income increasing) with the inventory method (the B/S.E. statistics are 2.231 and 2.328 respectively with p–values of 0.002 and 0.010). Also, the BETA coefficient is negative and statistically significant as predicted (the B/S.E. statistic is –2.106 with a p–value of 0.018). None of the other coefficients in Model (2) are statistically significant for the database. The omnibus test of the model coefficients for the database is statistically significant, as the chi–squared statistic was 15.807 with a p–value of 0.001. The model goodness of fit ($-2LL = 69.677$) confirms that including these terms in the model has achieved a substantial improvement in the fit. Furthermore, the predictability rate of the model for the database is quite good at 84.6%.

For owner-controlled firms in the database (see panel B of Table 7-21), the results suggest that MP has a statistically significant part to play in predicting choice of inventory policy by owner-controlled firms in the database (the B/S.E. statistic is 2.406 with a p–value of 0.008). None of the other variables have coefficients that are statistically significant. The combined test of the model coefficients reveals that the improvement in fit due to including only one variable in the model is statistically significant; the chi–squared is 5.531 with a p–value of 0.006. Again, the predictability rate of the model for the database is quite good at 82.8%.

Finally, the results in panel C of Table 7-21 suggest that only LEV1 has a statistically significant part to play in predicting the choice of inventory policy by

manager-controlled firms in the database (the B/S.E. statistic is 2.198 with a p–value 0.014). None of the other variables have coefficients that are statistically significant. The omnibus test of model is statistically significant, as the chi–squared of 7.826 has a p–value of 0.020.

**Table 7-21 Logistic regression y–variable inventory for the database firms**

| **Panel A: All firms (N = 96)** | | | | | |
|---|---|---|---|---|---|
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 2.477 | 1.110 | 2.231 | 1 | 0.013* |
| LEV1 | 0.017 | 0.007 | 2.328 | 1 | 0.010* |
| BETA | -0.923 | 0.438 | -2.106 | -1 | 0.018* |
| Constant | -2.789 | 1.150 | -2.424 | 0 | 0.015* |
| *Significant at the level 0.05, against a one–sided alternative. Model Goodness of Fit *-2LL* = 77.907. Omnibus test of model coefficients chi–squared = 15.807, p–value = 0.001. Overall percentage correctly predicted group membership is 84.6. | | | | | |
| **Panel B: OC firms (N = 31)** | | | | | |
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| MP | 2.996 | 1.245 | 2.406 | 1 | 0.008** |
| Constant | -2.996 | 1.025 | -2.924 | 0 | 0.003** |
| **Significant at the level 0.01, against a one–sided alternative. Model Goodness of Fit *-2LL* = 19.131. Omnibus test of model coefficients chi–squared = 5.531, p–value = 0.006 Overall percentage correctly predicted group membership is 82.8. | | | | | |
| **Panel C: MC firms (N = 65)** | | | | | |
| | B | S.E. | B/S.E | Exp. Sign | p-value |
| LEV1 | 0.021 | 0.010 | 2.198 | 1 | 0.014* |
| LEV | -0.038 | 0.019 | -2.039 | 1 | 0.979 |
| Constant | 0.394 | 0.980 | 0.402 | 0 | 0.687 |
| *Significant at the level 0.01, against a one–sided alternative. Model Goodness of Fit *–-2LL* = 58.917. Omnibus test of model coefficients chi–squared = 7.826, p–value = 0.020 Overall percentage correctly predicted group membership is 81.0. | | | | | |

The abbreviations defined in table 7-15 continue to apply for the variables.

Interesting points emerge from comparing the analyses of inventory method for the questionnaire and database. First, considering the results for the variables that are available in both questionnaire and database: as expected MP is positive and statistically significant both for all firms and for owner-controlled firms but not for manager-controlled firms. In addition, the LEV1 coefficient that features only in the

database analysis is significant both for all firms and for manager-controlled firms but not for owner-controlled firms in the database. LEV as the alternative is significant for manager-controlled firms in the survey. Also the BETA coefficient that features only in the database analysis is negative and statistically significant as predicted for all firms. Second, again the chosen models provide a better fit for the database than for the questionnaire.

A summary for results of the multivariate analysis is presented in Table 7-22. Overall, the multivariate analyses of the questionnaire data, presented in Tables 7-18 and 7-19, partially confirm the findings of the multivariate analyses of the database, presented in Tables 7-19 and 7-21. The results in panel A of Tables 7-18 and 7-19 strongly support the research hypothesis ($H1_a$); that firms that employ bonus plans are more likely to opt for the SLD method than those without bonus plans. Moreover, the results reported in panel B of Tables 7-18 and 7-19 support the research hypothesis ($H1_{Oa}$) that the managers of owner-controlled firms with bonus plans are more likely to choose SLD. The findings in panel A of Table 7-19 (but not those in Table 7-18) provide significant evidence in support of the research hypothesis ($H2_a$); that the higher the leverage, the greater the likelihood that a firm will choose the SLD method. Similarly, The findings in panel B of Table 7-19 (but not those in Table 7-18) provide significant evidence in support of the research hypothesis ($H2_{Oa}$); that the higher the leverage, the greater the likelihood that an owner-controlled firm will choose the SLD method.

The results in panel A of Table 7-21 (but not those in Table 7-20) support the research hypothesis ($H1_b$); that the higher the leverage, the greater the likelihood that a firm will choose the FIFO inventory method. The findings in panel A of Tables 7-21

(but not those in Table 7-20) provide significant evidence in support of the research hypothesis ($H2_b$); that the higher the leverage, the greater the likelihood that a firm will choose the FIFO inventory method. Similarly, the research hypothesis ($H2_{Mb}$), that the higher the leverage, the greater the likelihood that a manager-controlled firm will choose the FIFO inventory method, enjoys adequate support from the results for LEV1 in panel C of Table 7-21 and from Table 7-20[180].

**Table 7-22 A summary for results of the multivariate analysis**

| **Panel A: Support for H1 (Bonus hypothesis)** | | | | | | |
|---|---|---|---|---|---|---|
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | Y<br>p = 0.0004 | Y<br>p = 0.001 | Y<br>p = 0.001 | Y<br>p = 0.013 | Y | Y |
| Null rejected for OC firms | Y<br>p = 0.005 | Y<br>p = 0.049 | Y<br>p = 0.010 | Y<br>p = 0.008 | Y | Y |
| Null rejected for MC firms | a | N | N | N | N | N |
| H1 supported | Y | P | P | P | P | P |
| **Panel B: Support for H2 (Leverage hypothesis)** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | Y<br>p = 0.011 | N | Y<br>p = 0.010 | N | Y |
| Null rejected for OC firms | N | Y<br>p = 0.042<br>and 0.048 | N | N | N | P |
| Null rejected for MC firms | N | N | Y<br>p = 0.029 | Y<br>p = 0.014 | P | P |
| H2 supported | N | P | P | P | P | P |
| **Panel C: Support for H3 (Political costs hypothesis)** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | N | N | N | N | N |
| Null rejected for OC firms | N | N | N | N | N | N |
| Null rejected for MC firms | N | N | N | N | N | N |
| H3 supported | N | N | N | N | N | N |

Y means that the null hypothesis can be rejected, N means that the null hypothesis cannot be rejected, P means that the null hypothesis partially can be rejected and p referred to the p-valve. a means that the analysis was not possible.

[180] A summary of the multivariate regressions: listing only the significant variables is presented in Appendix 7-1.

## 7.4 Discussion of the results

Overall support for hypothesis H1 including the results of the univariate and multivariate analyses is presented in Table 7-23. The table indicate that the existence of management bonus schemes appears to be significantly associated with a firm's choices of methods of depreciation and inventory valuation ($H1_a$ and $H1_b$). Also, the hypotheses $H1_{Oa}$ and $H1_{Ob}$ those related to the association between the existence of management bonus plans and a firm's choices of methods of depreciation and inventory valuation in owner-controlled firms appear to be significantly. However, both hypotheses $H1_{Ma}$ and $H1_{Mb}$ those related to the association between the existence of management bonus and a firm's choices of methods of depreciation and inventory valuation in manager-controlled are not supported.

**Table 7-23 Support for H1**

| **Panel A: Univariate results** | | | | | | |
|---|---|---|---|---|---|---|
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | Y | Y | Y | Y | Y | Y |
| Null rejected for OC firms | Y | N | Y | Y | Y | P |
| Null rejected for MC firms | a | Y | N | N | N | P |
| H1 supported | Y | P | P | P | P | P |
| **Panel B: Multivariate results** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | Y | Y | Y | Y | Y | Y |
| Null rejected for OC firms | Y | Y | Y | Y | Y | Y |
| Null rejected for MC firms | a | N | N | N | N | N |
| H1 supported | Y | P | P | P | P | P |
| **Panel A: Summary** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | Y | Y | Y | Y | Y | Y |
| Null rejected for OC firms | Y | P | Y | Y | Y | P |
| Null rejected for MC firms | a | P | N | N | N | P |
| H1 supported | Y | P | P | P | P | P |

Y means that the null hypothesis can be rejected, N means that the null hypothesis cannot be rejected and P means that the null hypothesis partially can be rejected. a means that the analysis was not possible.

Overall support for hypothesis H2 including the results of the univariate and multivariate analyses is presented in Table 7-24. Considering the firms' leverage characteristics, the debt–to–equity variable (LEV1) is significantly related to the depreciation method at level of 0.05 in both of the univariate and multivariate analysis for all firms and owner-controlled firms but not for manager-controlled firms (see Table 7-4, panel B and Table 7-19). LEV1 also is significantly related to the inventory method at level 0.05 in the multivariate analysis both for all firms and for manager-controlled but not significant related in the univariate analysis, (see Table 7-6. panel B and Table 7-21).

**Table 7-24 Support for H2**

| **Panel A: Univariate results** | | | | | | |
|---|---|---|---|---|---|---|
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | Y | N | N | N | P |
| Null rejected for OC firms | N | Y | N | N | N | P |
| Null rejected for MC firms | a | N | N | N | N | N |
| H2 supported | N | P | N | N | N | P |
| **Panel B: Multivariate results** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | Y | N | Y | N | Y |
| Null rejected for OC firms | N | Y | N | N | N | P |
| Null rejected for MC firms | N | N | Y | Y | P | P |
| H2 supported | N | P | P | P | P | P |
| **Panel C: Summary** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | Y | N | P | N | P |
| Null rejected for OC firms | N | Y | N | N | N | P |
| Null rejected for MC firms | N | N | P | P | P | P |
| H2 supported | N | P | P | P | P | P |

Y means that the null hypothesis can be rejected, N means that the null hypothesis cannot be rejected and P means that the null hypothesis partially can be rejected. a means that the analysis was not possible.

Moreover, the debt–to–total assets variable (LEV) is statistically significantly related to the depreciation method in the univariate analysis for all firms and owner-

controlled firms but in the multivariate analysis the variable LEV is statistically significantly for owner-controlled firms only. LEV also is not significantly related to the inventory valuation method in the univariate but in multivariate analysis LEV is statistically significantly for manager-controlled firms only. This result applies in both the survey and the database.

Total sales (SALES) and total assets (ASSETS) were used as alternative proxies for political costs. This implies that larger Egyptian companies could be subject to more political pressure than the smaller ones. H3 related to political costs and hypothesised that larger firms would choose income–decreasing behaviour, despite reasons indicated in Chapter 6 that this might not be expected to occur in Egypt. Overall support for hypothesis H3 including the results of the univariate and multivariate analyses is presented in Table 7-25. Contrary to the hypothesis, the univariate results indicated that the sign of the coefficient of SIZE is positive. Nevertheless, the multivariate results showed no significant relationship between the variables of interest. These results are inconsistent with an expectation that concerns about political costs motivate Egyptian managers of large firms to choose accounting methods that reduce the reported earnings. The results for Total sales (SALES) and total assets (ASSETS) suggest that *SIZE* variable does not significantly affect managers' accounting choices in the Egyptian environment.

The different rates of tax paid by companies were not found to significantly affect their accounting choices. Cash flow effects of such choices may influence decisions but have been identified with other characteristics such as management control which may directly or indirectly influence choices. This might be due to large tax advantages that

are given to companies listed on the exchange in Egypt[181] which are unlikely to be found in most developed economies. The results above noted that CI and CR variables appeared to be significantly related to the choice of depreciation methods. Whereas, with the exception of BETA, none of the control variables appeared to be significantly related to the choice inventory valuation method in the multivariate analysis.

**Table 7-25 Support for H3**

| **Panel A: Univariate results** | | | | | | |
|---|---|---|---|---|---|---|
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | N | N | N | N | N |
| Null rejected for OC firms | N | N | N | N | N | N |
| Null rejected for MC firms | a | N | N | N | N | N |
| H3 supported | N | N | N | N | N | N |
| **Panel B: Multivariate results** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | N | N | N | N | N |
| Null rejected for OC firms | N | N | N | N | N | N |
| Null rejected for MC firms | N | N | N | N | N | N |
| H3 supported | N | N | N | N | N | N |
| **Panel C: Summary** | | | | | | |
| | Depreciation | | Inventory | | Overall | |
| | Survey | Database | Survey | Database | Survey | Database |
| Null rejected for All firms | N | N | N | N | N | N |
| Null rejected for OC firms | N | N | N | N | N | N |
| Null rejected for MC firms | N | N | N | N | N | N |
| H3 supported | N | N | N | N | N | N |

N means that the null hypothesis cannot be rejected and P means that the null hypothesis partially can be rejected. a means that the analysis was not possible.

In general the multivariate findings partially confirm the univariate findings. Overall, the empirical work provides an analysis of depreciation and inventory valuation methods based on binary logistic regression models. The results suggest that the firm's accounting choices are affected by the employment of management bonus schemes, and the depreciation and inventory policy choices are affected by its level of

[181] For more details see Business income taxation in Chapter 2.

leverage. On the other hand, the SIZE factor does not appear to be significantly associated with either the depreciation policy decisions or inventory valuation method of the firm (see Table 7-26). Taking an overview of the findings, there is evidence to support the relevance of the identified explicit contracting PAT hypotheses to accounting in Egypt. On the other hand, there is no empirical support in the data collected by the survey and the database for the relevance of the implicit contracting political costs hypothesis in Egypt.

**Table 7-26 Overall support for the formulated hypotheses**

| | H1 | H2 | H3 |
|---|---|---|---|
| Depreciation: | | | |
| All firms ($H1_a$, $H2_a$ and $H3_a$) | Y | P | N |
| OC firms ($H1_{Oa}$, $H2_{Oa}$ and $H3_{Oa}$) | P | P | N |
| MC firms ($H1_{Ma}$, $H2_{Ma}$ and $H3_{Ma}$) | P | N | N |
| Inventory: | | | |
| All firms ($H1_b$, $H2_b$ and $H3_b$) | Y | P | N |
| OC firms ($H1_{Ob}$, $H2_{Ob}$ and $H3_{Ob}$) | Y | N | N |
| MC firms ($H1_{Mb}$, $H2_{Mb}$ and $H3_{Mb}$) | P | P | N |
| Overall | P | P | N |

Y means that the null hypothesis can be rejected, N means that the null hypothesis cannot be rejected and P means that the null hypothesis partially can be rejected.

Differences between owner-controlled and manager-controlled companies can be observed in the highlighted parts of Table 7-26. Although the bonus hypothesis (H1) is only partially supported for the depreciation variable as far as both the owner-controlled ($H1_O$) and manager-controlled ($H1_M$) subsets are concerned, there are differences between the subsets for inventory valuation. Bonus hypothesis ($H1_b$)[182] is strongly supported in owner-controlled firms ($H1_{Ob}$) but is only partially supported in manager-controlled firms ($H1_{Mb}$). This observation is likely to be attributable to the

[182] Bonus hypothesis $H1_b$ indicates that managers of firms with bonus plans are more likely to choose income increasing inventory valuation method.

failure of the statistical analysis to identify significant differences associated with inventory valuation, because only 3 of the 33 manager-controlled firms in the survey and 4 of the 65 firms in the database did not remunerate managers using bonus schemes.

The debt hypothesis ($H2_a$)[183] relating to depreciation is partially supported in owner-controlled firms ($H2_{Oa}$) but it is not supported in manager-controlled firms ($H2_{Ma}$). Such a difference could be attributable to the fact that the survey data revealed that all manager-controlled firms used SLD and the database data showed that all but two of the 65 managers in manager-controlled firms used SLD, so the results about adopting SLD in manager-controlled companies could not be robust. (As there was no adequate basis for discrimination by reference to the use of SLD).

The debt hypothesis ($H2_b$)[184] relating to inventory valuation is partially supported in manager-controlled firms ($H2_{Mb}$) but it is not supported in owner-controlled firms ($H2_{Ob}$). This could arise because of the fact that the use of FIFO is likely to increase tax charges on reported profits. It is possible that executives of manager-controlled companies are more prepared to incur higher tax charges to increase reported income figures (Mikhail, 1999), whereas such behaviour seems more likely to be resisted by equity holders in owner-controlled companies (unless they are given convincing reasons) (Cloyd et al., 1996). One should, however, note that taxation related influences (if they exist) did not affect the findings for the bonus hypotheses. This difference

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[183] Debt hypothesis $H2_a$ indicates that the higher the leverage, the greater the likelihood that a firm will choose income increasing depreciation method.

[184] Debt hypothesis $H2_b$ indicates that the higher the leverage, the greater the likelihood that a firm will choose income increasing inventory valuation method.

might occur if the motivation, to increase reported earnings, from bonus considerations was greater than that associated with gearing in owner-controlled firms.

The political costs hypothesis (H3) is not supported by the sample data for any of the populations considered. However, one could generalise the results for the bonus hypothesis (H1) as the provision of material support in all of the three considered populations (all firms, owner-controlled firms and manager-controlled). The debt hypothesis (H2) received some, but less, overall support. Interestingly, the balance of support for the depreciation and inventory valuation hypotheses differed between owner-controlled and manager-controlled firms – which might have been the result of the different tax treatments of depreciation and inventory.

In the following chapter, a brief summary of the main findings of this study is presented and some areas for future research are proposed.

# Chapter 8: Summary, Conclusion, Limitations and Implication for Future Research

## 8.1 Summary and conclusions

The PAT approach developed by Watts and Zimmerman (1978; 1986) hypothesises that accounting choices are partly influenced by managerial opportunism. In particular, PAT researchers hypothesised that to avoid violating debt covenants and to increase their own remuneration when it is associated with company earnings, managers will often prefer income–increasing accounting methods. In contrast, it has been hypothesised that if there appears to be a likelihood of politically imposed costs because of the appearance of high levels of income and wealth managers will choose income–decreasing methods. PAT hypotheses have been tested frequently in Western industrialised countries, primarily in the U.S.A. Arguably, managers' behaviour is influenced by the cultural and institutional environments in which they operate. Consequently, it is possible that hypotheses that are well supported in studies of developed Western economies are less valid in emerging middle–eastern capitalist economies. This study provides evidence concerning the relevance of the established main theories of PAT in Egypt, a developing state with a recently re–established capital market.

The Egyptian empirical context of this paper provides a valuable opportunity to examine accounting choice in a relatively recently established, and rapidly growing, capital market. Egypt provides an interesting environment for the study of PAT hypotheses. Until the 1990s it had a largely managed economy with many state-owned enterprises. These organisations have progressively been privatised and the Cairo stock exchange has been re-established. Nevertheless, a majority of firms quoted on that exchange are primarily owned by very few people. Within the economy as a whole, there are still significant numbers of relatively large businesses that are similarly

closely owned and controlled. Furthermore, the government pursues taxation policies intended to encourage the expansion of businesses that potentially provide employment to its citizens. These policies produce differing, and often extensive, periods of relief from business taxation. Within this context, successful business growth will probably be valued – indeed it might even be rewarded by government agencies. Consequently, the conventional political costs hypothesis could be quite inappropriate. Indeed, the evidence presented in Chapter 7 suggests that this is the case.

Three main hypotheses were derived from the fundamental hypotheses of the PAT and were tested using Egyptian companies. Firstly, it was hypothesised that, *ceteris paribus,* managers of firms that employ management bonus plans are more likely to adopt income–increasing methods. Secondly, the debt contracting costs hypothesis suggests that managers of firms that are closer to violation of debt covenants are more likely to choose to increase earnings in an effort to avoid the costs associated with renegotiation of debt or bankruptcy. Because constraints on leverage (debt/equity) are often found in debt covenants, this variable was examined in this study. A third hypothesis was derived from the conventional political costs hypothesis which suggests that managers of larger firms will seek to avoid the costs associated with the increased visibility which accompanies high earnings levels. This suggests that managers of large firms are less likely to use an accounting change to increase earnings than are managers of smaller firms. There are, however, reasons for anticipating that the hypothesis may be inappropriate in Egypt. Total assets and total sales were used as proxies for firm's size.

These three hypotheses were examined separately for all firms, owner-controlled and manager-controlled companies. Specifically, where owners monitor managers closely, no bonus plan may be employed to motivate executives who in turn may have

fewer incentives to adopt increasing accounting choices. In contrast, for manager-controlled firms, bonus plans may be widely used to address the agency conflict between the goals of the shareholders and the aims of executives. In such circumstances, managers may have cogent self-interested reasons for choosing accounting alternatives which lead to higher reported earnings. However, in Egypt, owner-controlled firms may employ bonus plans if the large owners are not involved in the management and they employ professional individuals to represent them and manage the firms[185]. In such case, the executives of owner–controlled firms may be motivated to increase the reported earnings not only to maximise their personal benefits, but also to influence their reputation and increase the satisfaction of their employers. In addition, the nature and/or level of debt and the importance attached to political costs may also vary from manager-controlled to owner-controlled firms. Thus, all three hypotheses were examined for the two different owner-type companies.

The literature indicates that the use of accounting numbers in the contractual agreements between the parties who have an interest in the firm (i.e. shareholders, hired managers, debtholders and pressure groups) may motivate accounting choices that influence the accounting income. The accounting methods most frequently used in the literature for testing the PAT hypotheses are depreciation methods, inventory valuation methods, investment tax credit treatments and periods of pension amortization (see Hagerman and Zmijewski, 1979; Holthausen and Leftwich, 1983; and Watts and Zimmerman, 1986; Bowen et al., 2000; Bowen et al., 2002). Investment tax credits operate in the U.S.A. and some Western countries but not in Egypt. Also, pension

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[185] Under the Companies Law No. 159 of 1981, individuals or related group shareholders owning 10% or more of the total shares have a privilege to share in the management of the company or they can employ individuals to represent them and manage the firm.

amortization does not appear in Egyptian income statements because under EAS No.21 the pension system is subject to a special fund system and the investment of this special fund has a separate financial statement. Thus, the current study focused on management's inventory valuation and depreciation method choices which can have large systematic effects on the assets and expenses reported in firms' financial statements (Bowen, et al., 2000).

Previous research has indicated that accounting–policy choices may be determined by some explanatory variables related to the following characteristics of the firm: (i) whether a firm employs management bonus schemes or not; (ii) its leverage characteristics and (iii) its size as a proxy for the firm's political costs. On the basis of this theoretical framework, certain operational hypotheses were developed in this thesis (see Chapter 4). Beta, concentration ratio, capital intensity, profits and tax rate were adopted as control variables (see chapter 5).

The empirical study followed most preceding work in using an established database of the financial data of firms quoted on the stock market concerned. Given the special features applying in Egypt, it also analysed data from an independent questionnaire survey. This methodological expansion enabled mutual validation of, and challenge to, the findings from each independent source. It also allowed the study to be extended to large firms that are not quoted on the stock exchange and to companies that are, on average, smaller than the quoted firms. Given the objectives of this study, data was collected on firms': depreciation and inventory policies; ownership structure; management bonus plans as well as leverage and size characteristics (see Chapter 5).

Tests of the hypotheses constituted the second stage of the research project. A statistical analysis of annual reports, for the period 1999–2001, of a sample of firms operating in Egypt was conducted in order to test the hypotheses. In addition, factual

information collected through the questionnaire survey was used for testing certain hypotheses. The statistical analysis included a univariate and multivariate analysis for both owner-controlled and manager-controlled firms. The survey data revealed that all manager-controlled firms used SLD – which means that the analysis for such survey firms has not been possible for depreciation. Nevertheless, the overall analyses for the combined samples indicated that management incentive plans are significantly associated with income increasing depreciation and inventory valuation methods ($H1_a$ and $H1_b$). Furthermore, there are partial supports for the prediction that executives of owner-controlled firms with bonus plans are more likely to choose SLD and/or FIFO than those without bonus plans ($H1_{Oa}$ and $H1_{Ob}$). The findings provide weaker support for hypotheses $H1_{Ma}$ and $H1_{Mb}$ that executives of manager-controlled firms with bonus plans are more likely to adopt income-increasing depreciation–policy and inventory valuation decisions, which could be attributable to the observed tendency of such firms to adopt similar policies. The findings are mainly consistent with the bonus–hypothesis for owner-controlled firms but not manager-controlled firms. The findings also provide some support for the debt hypothesis (that the leverage of firms is positively associated with income increasing depreciation and inventory valuation policies). The study's findings provide some statistically significant support consistent with the expectation that managers of firms that are more highly leveraged are more likely to adopt SLD and FIFO inventory valuation methods than managers of firms that are less highly leveraged ($H2_a$ and $H2_b$). The findings provide also partial support for hypothesis $H2_{Oa}$ that executives of owner-controlled firms which are highly dependant on borrowing are more likely to adopt SLD, whereas, lend no support for hypothesis $H2_{Ob}$ that executives of owner-controlled firms with more highly leveraged level are more likely to adopt FIFO; this may be attributable to the different tax status of depreciation and inventory

costs. On the other hand, there is a partial support for hypothesis $H2_{Mb}$ that executives of manager-controlled firms with more highly leveraged level are more likely to adopt FIFO, whereas, the fact that almost all manager-controlled firms use SLD means that no support could be found for hypothesis $H2_{Ma}$ (that executives of manager-controlled firms which are highly dependant on borrowing are more likely to adopt SLD). Overall, firms which are highly dependant on borrowing and which are therefore close to violating their debt–covenants seem more likely to adopt income–increasing accounting options. It can be argued that the findings of the study provide some support for debt hypothesis.

Interestingly, when testing the political costs hypothesis, little difference in the behaviour of large and small companies was observed (for all firms as well as owner-controlled and manager-controlled firms). There was no significant association between the use of income–decreasing procedures and size (see Chapter 7). This may be because the large firms face few political costs in Egypt. The magnitude of the firm size apparently is not independently important to the decision to adopt certain accounting choice. This may attributable to the tax incentives provided for companies working in Egypt. The structural characteristics of the Egyptian business environment suggest that large firms in Egypt are unlikely to face significant political costs. Indeed, they are more likely to enjoy important tax–reducing benefits. It can be concluded that the findings of the present study are not consistent with the hypothesis that accounting–policy decisions of larger firms operating in Egypt are likely to reduce reported accounting income to avoid political costs.

The findings from the study as a whole (including both univariate and multivariate analyses) suggests that the existence of management incentive plans are significantly related to depreciation policies and inventory valuation methods that

increase accounting income. Also, there is some evidence that the leverage characteristics of firms are related to choices of depreciation policies and inventory valuation methods. On the other hand, the remaining factors examined in the study do not appear to be significantly associated with either the depreciation policy decisions or inventory valuation methods of firms in the study. One can therefore conclude that the findings of the current study are not inconsistent with the argument that accounting policy decisions of firms operating in Egypt can be explained on the basis of the economic consequences of theses choices. Overall, the study provides evidence to support the relevance of the identified explicit contracting PAT hypotheses to accounting in Egypt, but it lends no empirical support for the relevance of the implicit political costs contracting theory hypothesis in Egypt. It is perhaps surprising that the explicit contracting positive–theory approach which primarily based on the North American experience and institutional environment seems to be relevant to Egypt. One could reason that managers' motivations will inevitably be conditioned by the institutional, cultural, ethical and political environments in which they work. The findings of this study suggest that motivations of managers may be influenced by fairly common factors on an international basis. In contrast, as might have been anticipated, motivations derived from perceptions of political costs seem to be influenced by the potential environments in which firms operate.

## 8.2 Limitations of the study

There are several notable limitations inherent in the interpretation of the results of the study. One limitation concerns the questionnaire survey. The response rate seems reasonable at 29% but findings are still subject to the data problems always associated with that data collection method. The bias that can permeate the responses is a general

issue that disturbs all survey methods. Although, using database as another method can mitigate the deficiencies of survey–method studies, it cannot be guaranteed that the responses have been completely "shielded" against the danger of bias.

A further limitation is related to size of the sample. The 320 largest firms working in the Cairo area, the Alexandria governorate and the Menoufia governorate were used as the target sample for questionnaire survey. It is possible that this target sample is not representative of the general population of Egyptian businesses. This means that the results may apply only to the sample and cannot be generalized to other populations. In the case of the database, financial statements of firms being listed in the CSE were collected. By checking the publicly available records it was possible to determine the firms' depreciation and inventory valuation policies with almost absolute confidence. The analysis of the data from the financial statements provided significant insights about potential motives underlying firms' depreciation and inventory valuation decisions. However, the fact that the analysis of the annual reports was confined to the most frequently traded listed firms may mean that the findings from the analysis of the database could apply only to that category of firms. Indeed, the observed accounting choices could have been influenced by the fact that the firms were traded listed. Consequently, the conclusions drawn from the observed relationships in the database study should not be extended to non–traded firms. Thus, in line with the middle range thinking methodology, the findings advanced in this study relate exclusively to the empirical data obtained and analysed.

Finally, it should be noted that there might be factors/variables that affect managers' decision–making that have not been identified in this study. Nevertheless, the specific accounting measures that have been used in this study have been used extensively in earlier studies of managers' accounting policy choices.

## 8.3 Extensions and future research

The findings of the present study can provide a basis for further investigations of the factors that may influence accounting policy decisions of firms operating in Egypt. The present study has provided some evidence that some firm's characteristics such as the employment bonus plan and the level of leverage could influence Egyptian firms accounting policies. This study could be extended to include additional detailed information for ownership (such as the nationality of investors), and more details of management bonus plans.

In addition, future studies could examine whether the incidence of earnings management in the Egyptian firms is associated with monitoring by the Board of Directors. The role of outside Board members and the audit committee could also be explored. Prior researches, mostly in the U.S.A., have suggested that the likelihood of managers making income–increasing abnormal accruals to avoid reporting both losses and earnings reductions is negatively related to the proportion of outsiders on the board. Given these suggestions, it would be interesting to examine whether such influences appear to exist in Egypt. A further extension could investigate the influence of the identified variables on economic decisions that affect cash flows but involve management decision, e.g. "revenue investments" such as research and development expense, advertising expense and investments in inventory.

Adding variables that proxy for industry determinants of accounting method choices could also offer the opportunity to study the accounting choices of firms in more detail. It has been noted that accounting choice varies by industry (Watts, 1992). Research in a single country context has shown that there are industry effects on accounting practices. Earlier examinations of PAT (e.g., Watts and Zimmerman, 1978)

were criticized for not recognizing industry effects and later studies tried to control for industry (e.g., Daley and Vigeland, 1983). The nature of activities within an industry could be a reason for the diversity in both the amount and type of disclosure and measurement practices among firms in Egypt.

A new Egyptian stock market law, issued in August 2002, requires all listed firms to disclose full financial statements on a quarterly and semi–annual/annual basis. Firms that do not comply will be removed from the exchange. Indeed, from August 2003, the CSE will enhance its on–line electronic surveillance system for all listed firms. That means that in future a more comprehensive database will be available to researchers.

In addition, the investigations outlined in this study suggest that there are a number of further topics that are specific to Egypt that should merit more detailed examination. These examinations could deepen and extend the PAT related findings of the current project. They could, inter alia, investigate owner controlled firms in more detail. For example, the relationship between ownership structure and the use of bonus schemes could be researched using far more different criteria of ownership/control e.g. (i) using several levels of ownership between 10% and 51%, (ii) owner managed and professionally managed categories of firms and (iii) size of firms by reference to levels of capital and turnover.

Overall, the researcher hopes that this study will provide some contribution towards answering fundamental questions of whether, under what circumstances and how accounting choice matters. Versions of the model used in this study could be used to study accounting policy choices in other developing countries. It remains likely that PAT hypotheses that are well supported in the USA may not be appropriate in many other countries so that additional (and in some cases, different) variables may be needed to explain accounting policy choices in other economies.

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# Appendices

## Appendix 1-1 A summary of World Bank corporate governance report on codes and standards

| Market and Regulatory | Notes |
|---|---|
| Market cap | 120 billion L.E. (US$32.3) as of 12/31/2000 (35% of GDP) |
| Turnover ratio | 34% for year 2000 |
| Number of listed companies | 1076 companies listed, 659 traded. 141 are listed on official table, rest on unofficial table due to tax exemption on the equivalent of the CBE's deposit rate on paid in capital. |
| Legal system (origin) | Legal system (origin) French legal system with some other continental European influences. Islamic law does not shape the financial and corporate legal frameworks. Recent amendments to securities legislation are inspired by the Anglo– American legal framework. |
| Autonomy of capital markets regulator | CMA 7 members' board. Two directors, including chairman appointed by the President for 3 renewable years. |
| Powers of the capital markets regulator | Administrative powers. Under Egyptian constitution, financial and criminal penalties can only by imposed by a court. |
| Stock exchange governance | Cairo and Alexandria stock exchange. Quasi governmental body under supervision of CMA. 10 members' board; 5 elected by brokers, one director represents CMA, one the Central Banks and two the banking sector. |
| Corporate ownership structure | Concentrated with incidence of pyramid structures, cross holdings and bank participation. Average free float of traded companies: approx. 20%–25%. |
| **Shareholders' Rights** | |
| Voting rights | Up to 25% of capital stock may be issued as bearer shares. These shares cannot vote. Preferred stock enjoys privileges in 3 areas: Profit distribution, voting power and liquidation rights. |
| Proxy voting | Natural person must be shareholder or any juridical person. BOD member may not be proxy. |
| Ownership percent required to call shareholder meetings | 5% for ordinary meetings, 10% for extraordinary meetings. |
| Redress against violations/ minority oppression remedies | 5% if AGM decision favours a category of shareholders or BOD; or any individual shareholder who registers his/her objection during AGM and sues within one year. Companies' organization may also sue on behalf of shareholders. |
| Take-over code | To be drafted as integral part of competition legislation |
| Mandatory tender offer in change of control | At 20% for some or all outstanding shares. |
| Insider trading and self-dealing prohibition | Not specifically addressed, but provision of capital market law 95, article 64 can be used to sanction insider trading. |
| Pre-emptive rights | According to statutes of company |

| **Oversight of Management** | |
|---|---|
| Board structure | One tier BOD elected by the AGM. Chairman is often also CEO. Primary responsibility towards shareholders. Independent directors no concept of independent directors is unknown. The company law 159 allows for up to 2 experts to be appointed. |
| Committee practices | The BOD may create a sub–committee in charge of day–to–day management. No other committee practices. |
| External auditors | Appointed/removed by AGM. |
| Accounting – standards and enforcement | EASs are close to IASs, except with respect to financial leasing and other minor differences. |
| Company officers related disclosures | The AGM approves remuneration of BOD. |
| Disclosure of ownership | Disclosed in prospectus at time of listing and at AGM, but not to the level of ultimate beneficial owner. |

**Source:** World Bank Corporate Governance Report, issued 2001. The full text of the report is available at www. worldbank.org/html/fpd/privatesector/cg/ cg_rosc.htm (4.5.2002).
AGM denotes annual general meeting and BOD denotes board of directors.

## Appendix 3-1 Discretionary accruals measurement

| Author (s) | Discretionary accruals measurement |
|---|---|
| Healy (1985) | Non–discretionary accruals estimated by a mean value over a period |
| DeAngelo (1986) | Discretionary accruals are measure by total accruals. |
| Dechow and Sloan (1991) | Non–discretionary accruals are measured by the mean of the industry sector (the industry model). |
| Jones (1991) | Non–discretionary accruals are established by providing for the normal growth of the firm revenues and assets by normalizing with total assets at the beginning |
| Dechow, et al., (1995) (Jones modified)[186] | Models tested: Jones original, Jones modified, Healy, DeAngelo and the industry model. They conclude that the modified Jones model is the best to detect EM. |

Discretionary accruals and earnings management are used synonymously in the literature. The discretionary accrual models split total accruals into a discretionary component, which serves as a proxy for earnings management, and a non–discretionary component. The non–discretionary accrual together with operating cash flow is assumed to be the non–discretionary component of reported earnings. Consequently, if cash flows cannot be manipulated, the only way to manage the profit is to increase or decrease the accruals component.

$$Accruals_t = discretionary\ accruals_t + non-discretionary\ component_t$$

$$Non-discretionary\ component_t = non-discretionary\ accruals_t + cash\ flow_t$$

Kothari (2001) categorizes at least three streams of research that use the discretionary accrual models. First, discretionary accrual models are employed in tests of hypotheses about contracting costs which study management's incentives to manipulate accounting

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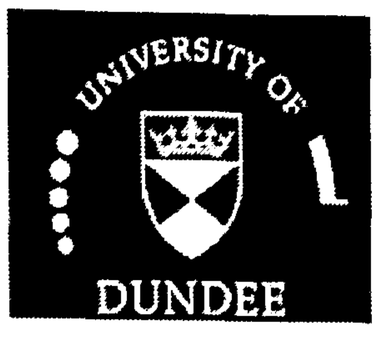
[186] Dechow, et al., (1995) critically examine Jones–model and conclude that Jones–model detects earnings management with low power and has some inherent biases.

numbers (i.e., the opportunistic use of accruals) (see Watts and Zimmerman, 1990; Holthausen, 1990). Second, using market efficiency as a maintained hypothesis, many studies test the efficient contracting and opportunistic hypotheses by correlating earnings components with share returns (e.g. Guay et al., 1996; Subramanyam, 1996). Third, a separate area of research tests market inefficiency by examining accrual manipulation with a capital market motivation (e.g., do managers have an incentive to manipulate accruals upwards in periods prior to stock issues in order to optimise the issue price (see Dechow et al., 1996a).

# Appendix 5-1 A questionnaire survey




*Department of Accountancy and Business Finance*

*Questionnaire*

**An Analysis of the Influence of Economic Factors on Accounting Policy Decisions in Egypt.**

**All responses will be treated in strictest confidence.**

**The identify of respondents will not be disclosed in any publication**

**Please answer the following questions by filling in the blank space or ticking the appropriate box.**

Q1. What is your position in your company:----------

Q2. In which main industry group(s) does your company operate?

| | | | |
|---|---|---|---|
| Textile | | Hotels and tourism | |
| Food and beverages | | Electrical appliances | |
| Steel | | Wood and paper | |
| Chemical production | | IT and communications | |
| Construction and housing real estate | | Pharmaceuticals and medical | |
| Building materials | | Other (please specify): - -------- ---------- | |

Q3. Is your company quoted on the Cairo stock exchange?

| Yes | No |
|---|---|
| | |

**If the answer to Q3 is "No" please go to Q5.**

Q4. Approximately, what is the total value of your company in Million of Egyptian pounds at current market prices?

| < £50 | £50-£100 | >£100-£250 | >£250-£500 | Over £500 |
|---|---|---|---|---|
| | | | | |

Q5. Please indicate your company's ownership status.

| | | Yes | No |
|---|---|---|---|
| A | One shareholder or one group (for example a family) owns 10% or more of the total share capital | | |
| B | A bank or insurance company owns 20% or more of the total share capital | | |
| C | One group of up to five shareholders (either physical persons or legal entities), who are not members of the same family own 10% or more of the total share capital | | |
| D | Your company is a privatised company and the government still owns more than 50% of the total share capital | | |
| E | Your company is a privatised company and the government still owns less than 50% of the total share capital | | |

Q6. What was the total value of your company sales in Million of Egyptian pounds during the last reported financial year?

| < £10 | £10-£25 | >£25-£50 | >£50-£100 | Over £100 |
|---|---|---|---|---|
| | | | | |

Q7. What was the last reported balance sheet value of the total assets of your company in Million of Egyptian pounds?

| < £50 | £50-£100 | >£100-£250 | >£250-£500 | Over £500 |
|---|---|---|---|---|
| | | | | |

Q8. Does your company employ bonus schemes to remunerate members of its board of directors?

| Yes |
|---|
| |

| No |
|---|
| |

**If the answer to Q8 is "No" please go to Q12.**

Q9. What is the bonus based on?

| Net income before tax | Net income after tax | Other (please identify) |
|---|---|---|
| | | |

Q10. Approximately, what the percentage of the bonus to salary of the chief executive officer was paid last reported year?

| 0- 25 (%) | >25-50 (%) | >50 -75 (%) | >75-100 (%) | 0ver 100% |
|---|---|---|---|---|
| | | | | |

Q11. Please specify the trend of percentage of bonus to salary within last three years?

| Increased substantially | Gone up a little | Stayed the same | Gone down a little | Gone down a lot |
|---|---|---|---|---|
| | | | | |

Q12. Approximately, what percentage of your firm's total assets in the balance sheet is financed by debt?

| 0-20 (%) | >20-40 (%) | >40-60 (%) | >60-80 (%) | >80- 100 (%) |
|---|---|---|---|---|
| | | | | |

Q13. What is the percentage of tax that you would expect your company to pay on net income?

| 0% | 1-10 (%) | >10-20 (%) | >20-30 (%) | >30-40 (%) | >40-50 (%) |
|---|---|---|---|---|---|
| | | | | | |

Q14. What depreciation method does your company employ?

| Class of asset | Depreciation method | | |
|---|---|---|---|
| | Straight line depreciation | Accelerated depreciation | Other (please specify) |
| Buildings | | | |
| Plant and machinery | | | |
| Vehicles | | | |
| Computers and office equipment. | | | |
| Furniture | | | |
| Intangible asset e.g. patents | | | |
| Research and development | | | |
| Goodwill | | | |
| Other (please specify): | | | |

Q15. How important are the following for your choice of the depreciation method?
(Scale: 1 = Not important at all, 2 = Not very important, 3 = Neutral, 4 = Important, 5 =Very important)

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Industry norm. | | | | | |
| Suitability for class of asset. | | | | | |
| Simplicity of calculation. | | | | | |
| Affect on net income. | | | | | |
| Contribution to the net cash flows over time. | | | | | |

Q16. What rate of depreciation does your company use?

| Class of asset | Depreciation rate | | | | |
|---|---|---|---|---|---|
| | Less than 5% | 5-10 (%) | >10-15 (%) | >15-20 (%) | Over 20% |
| Buildings | | | | | |
| Plant and machinery | | | | | |
| Vehicles | | | | | |
| Computers and office equipment | | | | | |
| Furniture | | | | | |
| Intangible asset e.g. patents | | | | | |
| Research and development | | | | | |
| Goodwill | | | | | |
| Other (please specify): | | | | | |

Q17. How does your company decide on the rate of depreciation?

| Class of asset | Basis | | | |
|---|---|---|---|---|
| | Reference to "UAS" | Industry norm | Company specific | Other (please specify) |
| Buildings | | | | |
| Plant and machinery | | | | |
| Vehicles | | | | |
| Computers and office equipment | | | | |
| Furniture | | | | |
| Intangible asset e.g. patents | | | | |
| Research and development | | | | |
| Goodwill | | | | |
| Other (please specify): | | | | |

**Note:** UAS represents "Uniform Accounting Systems".

Q18. Has your company changed the method of depreciation within last three years?

| | Yes | No | Do not Know |
|---|---|---|---|
| Buildings | | | |
| Plant and machinery | | | |
| Vehicles | | | |
| Computers and office equipment. | | | |
| Furniture | | | |
| Intangible asset e.g. patents | | | |
| Research and development | | | |
| Goodwill | | | |
| Other (please specify): | | | |

Q19. Please specify the trend of depreciation rate within last three years?

| | Gone up | Stayed the same | Gone down | Do not Know |
|---|---|---|---|---|
| Buildings | | | | |
| Plant and machinery | | | | |
| Vehicles | | | | |
| Computers and office equipment. | | | | |
| Furniture | | | | |
| Intangible asset e.g. patents | | | | |
| Research and development | | | | |
| Goodwill | | | | |
| Other (please specify): | | | | |

Q20. What inventory valuation method does your company use?

| Class | Inventory method | | | |
|---|---|---|---|---|
| | FIFO | LIFO | Weighted average | Other (please specify) |
| Raw material | | | | |
| Work in progress | | | | |
| Final product | | | | |
| Other (please specify): | | | | |

Q21. How important are the following for your choice of the inventory valuation method? (Scale: 1 = Not important at all, 2 = Not very important, 3 = Neutral, 4 = Important, 5 =Very important)

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Industry norm. | | | | | |
| Approximation of the current market price. | | | | | |
| Simplicity of calculation. | | | | | |
| Affect on tax charges. | | | | | |
| Affect on net income. | | | | | |

Q22. Has your company changed the method of inventory valuation within last three years?

| | Yes | No | Do not Know |
|---|---|---|---|
| Raw material. | | | |
| Work in progress. | | | |
| Final product. | | | |
| Other (please specify): | | | |

**Appendix 6-1 Alternative combinations of accounting policies and income strategies**

| Combination | SLD | FIFO | Classification of strategies* | Sample in the survey | | Sample in the database | |
|---|---|---|---|---|---|---|---|
| | | | | Frequency | % | Frequency | % |
| 1 | 0 | 0 | 1 | 11 | 11.5 | 19 | 20.4 |
| 2 | 1 | 0 | 2 | 66 | 68.7 | 34 | 36.6 |
| 3 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 4 | 1 | 1 | 3 | 19 | 19.8 | 40 | 43.0 |
| Total | | | | 96 | 100 | 93 | 100 |

*Strategy 1 consists of both choices being income–decreasing; strategy 3 is both choices are income–increasing

This table is based on an idea taken from Zmijewski and Hagerman (1981, table 1). Given the two policy choices (depreciation and inventory) and two choices for each policy (income increasing and income decreasing) there are $2^2$, or 4 combinations that firms could follow as shown in Appendix 6-1.

**Appendix 7-1 A summary of the multivariate regressions: listing of the significant variables**

| | **Incremental analysis** | | | |
|---|---|---|---|---|
| | Depreciation choice | | Inventory valuation choice | |
| | Survey | Database | Survey | Database |
| Table | 7-14 | 7-15 | 7-16 | 7-17 |
| All firms | MP | MP, LEV1 and CR | MP | MP and BETA |
| OC firms | MP | LEV1, CI, CR and PROFIT | MP | MP, BETA and CR |
| MC firms | – | MP and BETA | TAXRATE | – |
| | **Backward elimination logistic regression** | | | |
| | Depreciation choice | | Inventory valuation choice | |
| | Survey | Database | Survey | Database |
| Table | 7-18 | 7-19 | 7-20 | 7-21 |
| All firms | MP | MP, LEV1, CI and CR | MP | MP, LEV1 and BETA |
| OC firms | MP | MP, LEV1, LEV and CR | MP | MP |
| MC firms | – | – | LEV | LEV1 |